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## A SIMPLE GARBAGE INCINERATOR AND CREMATORY.—AN IMPROVED FORM OF APPARATUS FOR RE-GENERATING FORMAL-DEHYD GAS.

By J. J. KINYOUN, M. D., U. S. M. H. S. Federal Quarantine Officer.

During the month of May, 1900, when the San Francisco Board of Health imposed a quarantine on a considerable area of the Chinese quarter of San Francisco, on account of the appearance of bubonic plague there, it was at once confronted with the question what to do with the garbage and street refuse. It was out of the question to dispose of this refuse in the ordinary way, so it became immediately necessary to devise some plan for its destruction, wherein there would be no menace to the public health. In discussing the subject with the several members of the board, the writer offered a suggestion that the problem would be best solved by the erection of a cremator of simple design and construction within the quarantined area, for incinerating the garbage and street refuse.

My attention had some time before been directed to the use of crude oil as a fuel for cremating garbage and refuse, and it immediately suggested itself as a ready means to meet the peculiar conditions which had suddenly arisen in Chinatown. Acting upon this suggestion, the board of health made arrangements with the firm of W. W. Montague & Co., of San Francisco, to erect a crematory after the plans and suggestions furnished by the writer, the funds being donated by the Citizens' Relief Committee, who were then actively cooper-

ating with the board in its efforts to clean up Chinatown and stamp out the plague infection.

The crematory was erected within a few days and put in operation, and was continued until after the compulsory abandonment of the quarantine measures. It proved so highly satisfactory and efficient in its operation that it is deemed worthy of a short description.

It was constructed of brick, and was of the following dimensions: 20 feet long, 4 feet wide, and 4 feet 6 inches high. The oil burner was placed in one end about the middle, and openings made for the entrance of air on both sides. Cast-iron furnace doors were also provided at either end for cleaning or for the manipulation of the garbage. Ordinary grate bars were placed about 14 inches above the floor of the cremator, and supported at intervals by iron cross bars.

A chimney of about 20 feet high and 16 inches in diameter was provided at the opposite end from the one containing the burner. Additional openings for draught were provided for along each side.

The garbage was fed to the furnace through "man holes" at the top.

The fuel was crude petroleum, burned by means of a Larkin burner.

A small 6 horse-power boiler furnished the steam, and the petroleum was delivered to the burner under a 30-pound pressure, by means of a small Duplex pump.

The flame resulting from the combustion of petroleum under the above conditions would readily fill the whole of the furnace, and so intense was the heat



that the interior would be made red hot within an incredibly short time.

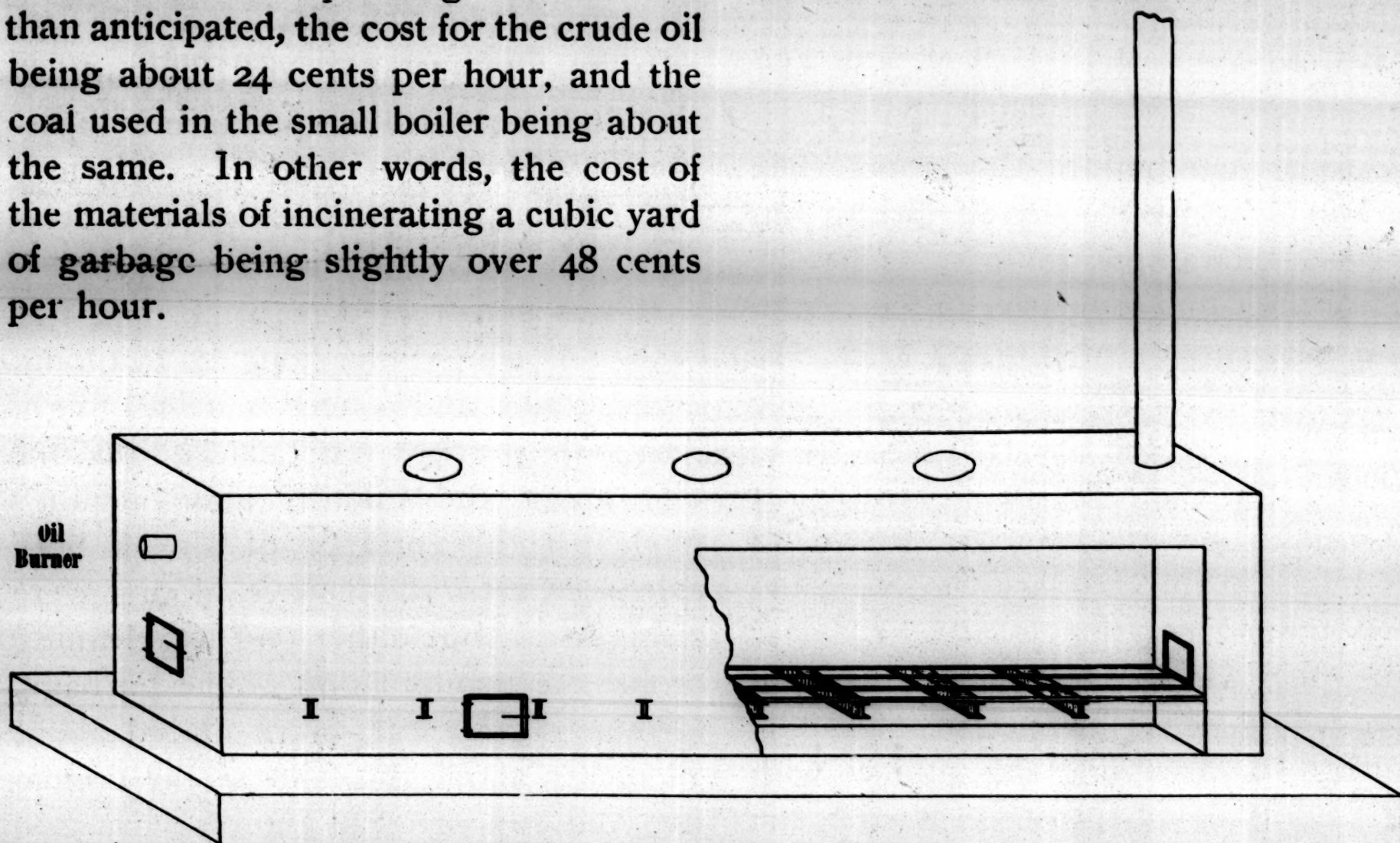
The amount of garbage consumed was about 17 cubic yards per hour, or 200 cubic yards per day. This was done with the greatest ease, with such perfect combustion that little or no odor was noticeable.

The cost for operating was far less than anticipated, the cost for the crude oil being about 24 cents per hour, and the coal used in the small boiler being about the same. In other words, the cost of the materials of incinerating a cubic yard of garbage being slightly over 48 cents per hour.

it is believed that under ordinary conditions the cost of construction can be considerably reduced.

The accompanying sketch shows the form of the incinerator and manner of its construction.

The garbage incinerator having made such a satisfactory showing, both as to efficiency and economy, it has occurred



GARBAGE INCINERATOR.

The cremator has so far exceeded the expectations of the writer and proven so successful, that this form of a garbage incinerator is recommended for use in a quarantine of the character above referred to, or for use at detention and military camps.

No claim is advanced that this method is cheaper than the reduction of garbage and street refuse by incinerators operated by coal. It appears to answer the purpose better under the circumstances as narrated above, because of the simplicity of construction, the rapidity with which such an apparatus can be installed.

The cost of construction of the cremator was something near \$1,400, but

to the writer that this same principle could be applied to the cremation of bodies, and a crematory for this purpose could be erected at a much less expense than those now in use, and would be admirably adapted for quarantine stations and detention camps.

Taking advantage of the experience gained with the garbage incinerator, a small experimental cremator was erected at the San Francisco Quarantine Station. The plan upon which this was constructed was the reverse of those wherein a retort is provided for the reception of the body, and instead of the indirect heat, the flame of the burning oil is made to play on the body direct.

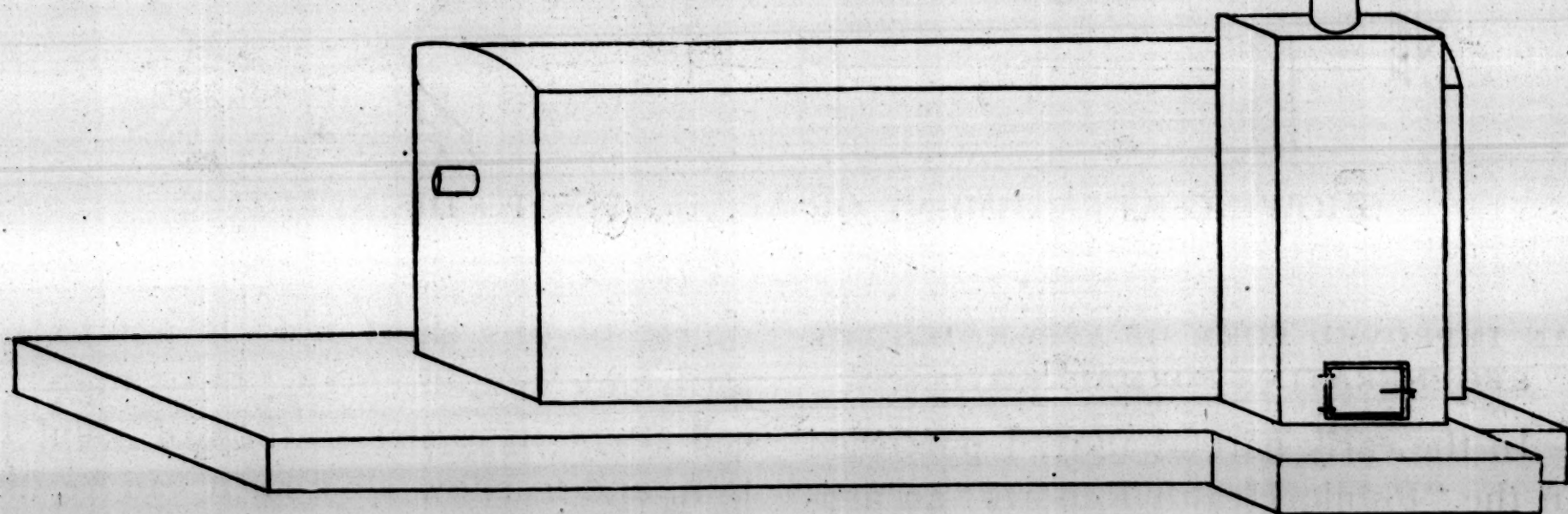


In fact, it was a return to the first practices of cremation.

It was first thought that the flame after leaving the body should be made to pass through a space along the full length of the furnace, in order that any gases incident to the combustion would be consumed; but experience has demonstrated that this precaution was unnecessary, and that the complete combustion of the gases could best be accomplished by utilizing a part of the chimney as the combustion chamber.

This plan offered the additional advantage of simplifying the construction and diminishing the cost.

The dimensions of this crematory are: 10 feet 4 inches in length, 3 feet 7 inches in width, and 3 feet 10 inches in height.



CREMATORY.

This gives a space, including the combustion chamber, of approximately 140 cubic feet.

A large iron oven door of 20x26-inch dimensions is placed in the end nearest to the chimney, the oil burner in the opposite end and near its center. The burner is similar in all respects to that of the garbage incinerator.

The interior of the cremator can be heated to a white heat within half an hour; in fact, the heat is so great that the surface of the fire bricks are vitrified; a temperature sufficient to melt cast iron

can be obtained within an hour. This high temperature appears to completely consume the gases, so that no odors are perceptible. The accompanying sketch is intended to show the construction of

such a cremator. The method of operating is as follows: The furnace is heated for half an hour, until the interior is brought to a red heat, the burner shut off, and the body, which has been previously prepared by wrapping in a sheet saturated with alum, is pushed into the crematory, the door closed, and the burner put into operation.

The introduction of the body is facilitated if it is prepared in the following manner:—

A pine board slightly wider than the body is covered with a piece of sheet

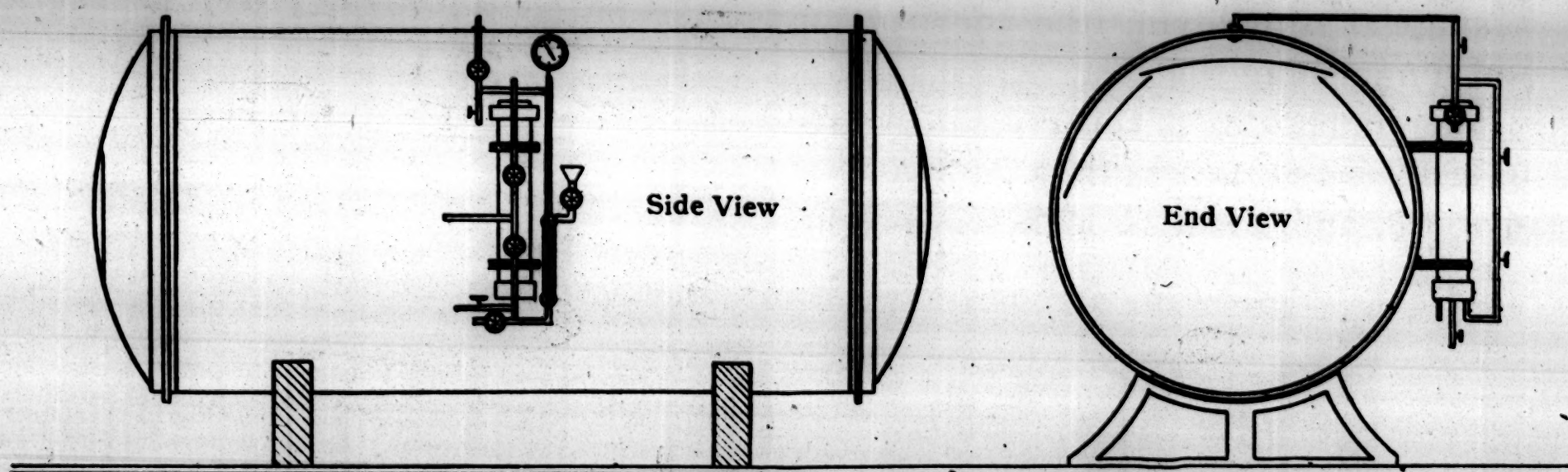


iron, held in place by a few tacks. The body being placed on this board can be easily pushed in. The pine board is burned, leaving the sheet iron containing the ashes.

The time required for cremating a body is less than two hours, and the amount of oil necessary for this reduction is not over 15 gallons.

The cost of such a cremator complete, including oil burner, a small steam boiler, duplex pump, tank, etc., will not be over \$500.

The advantage of this apparatus lay in the fact that any desired percentage of gas could be obtained at will, and that a thorough disinfection of an article could be accomplished in the minimum time. At my suggestion, an exhaustive series of experiments was undertaken by my colleague, Dr. E. K. Sprague, then on duty in the hygienic laboratory, who was able to confirm the statements as well as to determine with exactness the range of usefulness of this agent applied in the manner indicated above. The



SHOWING ATTACHMENT OF APPARATUS TO DISINFECTOR.

#### AN IMPROVED FORM OF APPARATUS FOR REGENERATING FORMALDEHYD GAS.

In the early part of 1897, I published in the "Public Health Reports" an article entitled "Formaldehyd as a Disinfecting Agent, and Its Practical Application," in which mention was made of a device for applying formaldehyd, in connection with the apparatus known as the steam disinfector or chamber. By this method disinfection of articles may be more thoroughly accomplished than by the ordinary methods.

The apparatus or attachment designed for this purpose consists of a small boiler provided with a coil for heating its contents. On its top or upper side are placed the filling attachment, pressure gauge, and discharge pipes. On the sides are the water gauge and drips.

object of this short note is not to set forth any new discovery, but simply to call attention to this method of disinfection, and to show wherein it can be improved and its efficacy increased.

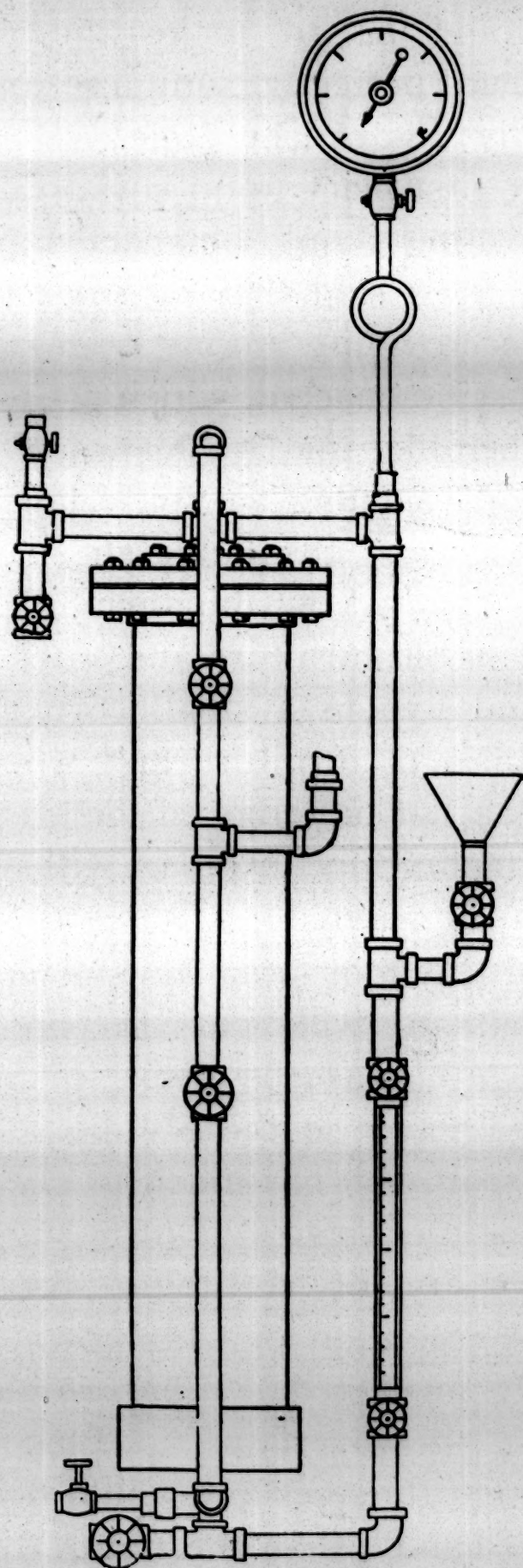
My experience at the San Francisco Quarantine Station during the past eighteen months, during which time the effects of over 30,000 persons have been disinfected, has demonstrated a number of minor defects in the apparatus as proposed in 1897, which have been remedied by a new apparatus of a different form and simpler construction. The small boiler, placed horizontally, having a coil of steam pipe at its lower side, was found to be unsatisfactory on account of the length of time consumed in regeneration of the gas from the mixture. Especially was this so when a small quantity of the



liquid was used and the level was below the coil. Then another undesirable feature was the tendency of the formalin mixture to boil over bodily into the disinfecter, and if due care was not exercised, there would be an injury done to the articles undergoing disinfection.

with pipe and connections for steam, for filling and discharging, as well as with necessary water and steam gauges, as is shown in the accompanying cut and diagrams.

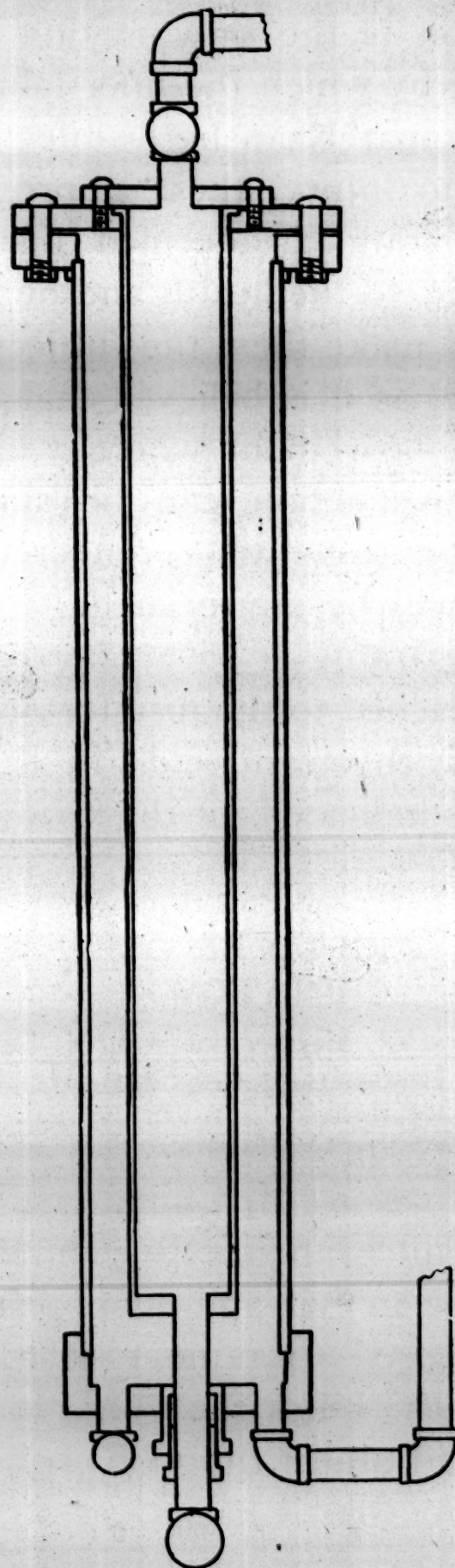
The advantage claimed for this form of attachment is, that,



FORMALDEHYD APPARATUS.

The newer form of apparatus has overcome these difficulties, and it is believed to be a vast improvement over the old.

It consists of a copper tube, jacketed by an iron pipe, having a space of  $1\frac{1}{2}$  inches to 2 inches between the outer and inner wall. The ends are closed by brass caps. The apparatus is provided



FORMALDEHYD APPARATUS.  
Vertical Section.

(1) It is of simple construction; all the parts save the brass end caps are made of materials of standard sizes.

(2) It is far more efficient than the old form, the evolution of the gas from a given quantity being accomplished in less than one-half the time.

(3) The evolution of the gas can be



more readily controlled, and the accident of sudden boiling over of the liquid into the disinfecter prevented.

(4) It can always be kept clean and in good order, and the cost of construction is less than one-half that of the former apparatus.

Owing to the fact that formaldehyd disinfection is the only method at our command by which the finer fabrics and wearing apparel can be disinfected with little or no injury, these improvements in the apparatus are deemed of sufficient importance, to the health and quarantine officers, to make them the subject of this short note, as it is believed that any device or improvement whereby the process of disinfection can be simplified, and at the same time rendered more efficient, will be appreciated.

The apparatus is so arranged that it can be attached to the disinfecter and be supplied with steam, etc., in the same manner as indicated for the former apparatus.

#### WHAT SHOULD BE DONE WITH CHINATOWN?

By DOUGLAS W. MONTGOMERY, M. D., Professor of Diseases of the Skin, Medical Department University of California.

The situation of Chinatown in the midst of San Francisco is generally conceded to be an evil, and many plans have been proposed to remove it to somewhere on the outskirts. One plan suggested is to allure the Chinese to some new locality, but it has never struck me that any of the enticements offered would be strong enough to induce Ah Sin to change his place of residence, and as for forcing him to move, every one knows how that has failed in the famous "laundry suits." A Chinaman may keep a laundry going at full head and giving off a true oriental flavor in spite of his neighbor, who may be the most influential man in the city.

One way of solving the difficulty would be to condemn the land as a park. This remedy, however, would be expensive, and the new Chinese quarter would soon be as unsanitary as the old one. Just think of the expense involved in moving the residences of about 25,000 people! It seems to me the wisest plan would be to make the present Chinatown perfectly sanitary, and undoubtedly this can be done.

In the first place good laws to prevent overcrowding should be enacted and enforced. It is said that in order to prevent overcrowding among orientals, two laws must be enacted, which act towards each other like the two blades of a pair of scissors, a cubic air space law and a floor area law. If a cubic air space law alone is enacted, a Chinaman will heap up a lot of old furniture and truck in his room and live in a small corner of it. These piles of furniture and wood and debris can not be removed, because they do not technically interfere with the air space of the room.

If only a floor area law be enacted, a Chinaman will put in floors as close together as the decks of an old-fashioned slaver in the Middle Passage.

To a man who has much to say in the government of this city I once suggested the necessity of rectifying the overcrowded condition of Chinatown. He promptly answered, "What would you do with the overflow?" One could answer that the overflow would be much easier to handle than the removal of the entire Chinese quarter to some other locality. Yet it must be said that the crowding is such that even the overflow would be a problem.

The Chinese should be forced to sleep aboveground, and should be compelled to leave the cellars. Our Board of Health has tried to remove the Chinese from the cellars several times, and has



always been enjoined. Either the legal methods of the Board of Health are faulty or the law does not cover the necessities of the case.

Chinatown should be immediately re-sewered according to the separate system; one set of pipes for the sewage and another for the street water, as was long ago insisted upon by the late Dr. J. H. Stallard. This sewer system is by far the best, especially in a country where there is a dry season and a wet season. If a sewer is made large enough to carry off both sewage and surface water at the time of year when the surface water is very abundant, it is altogether too large for the sewage alone when there is no rain water. In the dry season the sewage stagnates on the floor of a large sewer, the small quantity of water forming a meandering rivulet through the fetid mass. This stagnant sewage nourishes the rats and forms excellent pabulum for breeding disease. Such sewers, becoming infected through the rats, might make plague, for instance, endemic in San Francisco in spite of all efforts to disinfect aboveground. Of course in a city so favorably situated as San Francisco, we can always have an abundance of sea water to flush the sewers, no matter how large; but in no case should there be any question about thorough flushing, and a small sewer is easier to flush successfully than a large one. I believe attention has frequently been drawn to a reservoir on the hill above Chinatown that might be used for flushing. Alameda is an instance of the successful use of the separate sewer system.

One of the many commendable things our present board of health did last summer was poisoning rats. Another help in eliminating these dangerous rodents would be drowning them by flushing.

The streets of Chinatown, where the grade is not too steep, should be asphalted, so that they could be washed down until perfectly clean.

Should the plague appear at any time in a house in San Francisco, it ought to be unroofed, the doors and windows removed, and even the floors should be taken up, so that light and air could get to every part of the structure, and the entire structure should be whitewashed. It is a wonderful thing, the value of direct sunlight as an antiseptic in plague. Plague bacilli exposed to direct sunlight die in a few hours, whereas they may live for a long time in darkness, dampness, and with a moderate temperature.

The whitewash brush is also one of the best agents we have to combat this disease. The whitewash brush buries the germs as in a cemetery, and there is the further advantage that one can see at a glance any part of a room that has not been whitewashed. In Bombay, I understand, sunlight and the whitewash brush are looked upon as being superior to all other antiseptics, and this conclusion was arrived at after nearly bankrupting the city treasury buying other antiseptics. I do not mean to say that all other antiseptics are useless; but they are not as efficient as sunlight and whitewash.

The inmates of a plague-stricken house should be put into a detention hospital, and their belongings should be disinfected in a steam disinfecting plant, such as was suggested last year by Dr. Louis Baret. Almost all large European cities are now furnished with public steam disinfecting plants. They are useful in diphtheria, scarlet fever, and other infectious diseases.

From what has been said of sunlight as a disinfectant in plague, it might be inferred that it would be cheaper and better than the use of a disinfecting



plant. The sun, however, does not always shine, and it is slower than steam, and an essential thing about disinfecting clothing and furniture is promptness and despatch, otherwise the goods accumulate. In short, sunning is not practicable.

In speaking of light it would be very desirable to have daylight enter every room in a building. Such an abundance of light may not be attainable, however, but the unlimited cutting up of large rooms into small ones ought to be prevented. The Chinese like to take a large room and divide it into many small ones by wooden partitions. In Hong-kong, I understand, they allow them to do this; but the authorities require all the upper part of such partitions to be of latticework, to allow the free circulation of air, and they insist on frequent white-washing.

To resume: The prevention of overcrowding, the construction of a proper sewer system, the dismantling of every building where plague appears, the construction of a detention hospital, and the establishment of a steam disinfecting plant, are, to my mind, the most important sanitary measures to enforce in Chinatown, and none of them should be neglected, whether one believes plague is or is not present.

#### THE BACTERIOLOGICAL DIAGNOSIS OF DIPHTHERIA.

By W. H. KELLOGG, M. D., Bacteriologist to the San Francisco Board of Health.

*Read before the San Francisco County Medical Society, February 12, 1901.*

Diphtheria is an acute, infectious, and contagious disease, with local lesions and a general systemic intoxication, caused by the Klebs-Löffler bacillus. If we accept this definition, we must consider that cases of sore throat, even when accompanied by the presence of a pseudo-

membrane, but in which repeated examinations fail to show the diphtheria bacillus, are not true diphtheria. On the other hand, cases of sore throat in which the bacillus is found, are diphtheria, and no matter how mild the clinical symptoms may be, are contagious to others..

That the Klebs-Löffler bacillus is the cause of diphtheria has been demonstrated by the regulation requirements, namely: (1) Its constant presence. (2) Its isolation in pure culture. (3) The reproduction of the disease in animals by inoculation with pure culture; and (4) the finding of identical lesions and distribution of organisms in the experimental as in the original disease. As a result of the implantation of the Klebs-Löffler bacillus on the mucous membrane of the throat, there is produced usually a pseudo-membrane, which consists of a fibrinous exudation and necrosis of the epithelium and upper layer of the mucosa. This membrane, when examined in section, is seen to be formed of a fibrillar network, in which are embedded epithelial cells, infiltrating leucocytes, and diphtheria bacilli. The epithelium undergoes a granular degeneration and coagulation necrosis, but the connective tissues beneath the mucosa are rarely involved. The blood-vessels become obstructed by thrombosis or compression, and the patch, therefore, has a whitish or dirty white or even brownish appearance. It generally begins as one or several patches on the tonsil and rapidly spreads to other parts, or it may remain confined to the tonsil. When the membrane is detached, a raw, bleeding surface is exposed, which is soon again covered by membrane.

The bacillus of diphtheria was first discovered by Klebs, in 1883, and was subsequently isolated and proved to be the cause of the disease by Löffler.



Hence the designation, Klebs-Löffler bacillus. The organism is one that is readily recognized by its morphological and cultural characteristics and by its pathogenic activity when inoculated into guinea-pigs and kittens. It is a non-motil, non-liquefying, and non-spore-bearing bacillus, measuring from  $1\frac{1}{2}$  to 8 microns in length and from  $\frac{1}{2}$  to 1 micron in width. It generally takes the stain very irregularly, the protoplasm appearing to be broken up into segments, with unstained or faintly stained intervals between. It varies greatly in form according to the temperature and media on which it is grown and age of the culture. Large curved and club-shaped forms are common, and short, oval and lozenge-shaped bodies are occasionally seen. It grows on all the ordinary culture media, but thrives especially well on Löffler's blood serum, and at a temperature of 35 degrees C. The germ resists drying and may retain its vitality on objects such as children's toys for many weeks. They are killed rapidly by a  $\frac{1}{1000}$  bichlorid solution or 5 per cent carbolic acid, and are destroyed in ten minutes by a temperature of 58 degrees C. The bacilli are found only at the local site of the disease, which is therefore not the result of a general invasion of the body, but is an intoxication by the soluble poisons or toxins produced by the activity of the germ at the local site of the disease. It is these soluble toxins that cause the constitutional symptoms and the degenerative processes of internal organs.

**BACTERIOLOGICAL EXAMINATION.**—This includes the securing of a specimen of secretion from the throat, the planting of this on the surface of blood serum, and the incubation of the culture at 35 degrees C. for at least 12 hours, after which the resulting colo-

nies are examined microscopically. A swab is prepared by twisting a small piece of cotton on the end of a wire, which is then put into a six-inch test tube, plugged, and sterilized by dry heat. These can be taken to the bedside of the patient, the swab brushed over the visible membrane, after which it is replaced in its tube and taken to the laboratory. In using the swab, care should be taken to avoid touching the cotton against anything except the throat to be examined. A good light will facilitate matters, and the swab should be rubbed gently but freely against any visible membrane, avoiding touching any other part. If there is no membrane, or it is confined to the larynx, pass the swab back as far as possible and rub against the mucous membrane of the pharynx and tonsils. After securing the swab, it is brushed over the surface of a tube of solidified blood serum, which is then placed in the thermostat at 35 degrees C. for at least 12 hours.

The appearance of the growth on the serum is quite characteristic if the diphtheria bacillus is present in nearly pure culture; of course other organisms may be present in such numbers as to change its character completely. In the former case, the growth will be in the form of small, drop-like, opaque, whitish colonies, or, if the colonies are very numerous, it will appear as a uniform white or yellowish white layer. Several slides should be prepared from each culture tube, one from each kind of colony that appears, or if an even layer is present, material should be taken from different parts of the tube.

The boards of health of most large cities now supply these swab outfits and make the cultures and microscopical examination free of charge. In our own city, the swabs may be obtained at the



health office, and if returned the same day before 4 o'clock p. m., a written report will be mailed to the physician the next morning at 10 o'clock. If the result showed diphtheria, he will be so informed by telephone immediately.

Now a word as to the value of the bacteriological examination and what measure of importance is to be apportioned to its results. Is it possible to make an early positive diagnosis without a bacteriological examination?—I do not think it is. Pseudo-membranes may be produced by streptococci and other organisms, and the cardinal symptoms of diphtheria may be very infrequent or irregular in their appearance. Again, true diphtheria may exist without the appearance of a membrane, the latter being a local effect of the presence of the bacillus, due to the action of a chemical substance in the bodies of the bacilli. This substance may vary in the intensity of its action without a diminution in the production of the toxalbumins which cause the constitutional symptoms. Sometimes it is not possible to exclude diphtheria even with the microscope, at least on a first examination. The bacteriologist sometimes reports the absence of diphtheria bacilli in the culture. If the clinical symptoms indicate diphtheria, the case should be treated as such, for the bacteriologist did not say it was not diphtheria, but only that he was unable to find the bacillus. The reason for this failure to find the germ may be one of the following, and a second examination might settle it positively. 1. An antiseptic spray may have been used not long before taking the swab. 2. The swab may have been faultily infected. 3. The following occurrence will illustrate another difficulty and at the same time show the necessity for thorough work in the laboratory. I received swabs from two dif-

ferent cases in the same family. The culture from one showed nothing but staphylococci, while the other showed a mixed infection with a very few bacilli which looked suspicious, but were not at all typical. I sent word to the physician that the latter case was indefinite and that after a further incubation I would re-examine. The next day both tubes showed a typical culture of diphtheria bacilli. The reason for the finding of the bacilli in the tube, which had previously shown only staphylococci, was this: The surface of the blood serum was thickly studded with colonies of staphylococci, between which were minute colonies of diphtheria bacilli, their growth inhibited by the preponderating growth of staphylococci. The latter soon reached their maximum of growth, and the platinum loop, brushing over the surface for the first examination, distributed the few diphtheria bacilli over new territory, allowing them to grow without interference from the staphylococci. On another occasion I received a swab and a piece of membrane from the same case. The culture from the swab did not show any diphtheria bacilli, but the culture from the membrane did. Sections of this membrane were also beautiful histological preparations, showing the bacilli in the meshes of the fibrinous exudate.

We have seen, then, that the work of the bacteriologist should have its proper place in diagnosis and that his results should be applied with judgment to the individual case. One negative examination should not be taken as conclusive, especially if the clinical aspect of the case does not coincide. But repeated examinations are positive in their results. We should consider the microscope as only one of the aids, just as we do auscultation or percussion in other diseases, although its results are



frequently more reliable. Compare the results of laboratory methods in the diagnosis of diphtheria with those obtained in the examination of other diseases. We all know that one negative result in the search for tube casts in the urine does not exclude nephritis; neither does one negative result in the test for albumen; one negative result in the search for plasmodium malariae does not exclude malaria; nor does the absence of tubercle bacilli in the sputum on one examination exclude tuberculosis, nor the absence of Widal's reaction exclude typhoid fever on one examination; yet no one will deny that the presence of albumen and tube casts is of value in the diagnosis of nephritis, and no one can deny that the presence of tubercle bacilli means tuberculosis, or that the plasmodium malariae means malaria. We have considered what we are to think if the examination was negative. Suppose a bacillus was found in great numbers, either pure or mixed with staphylococci or streptococci, which morphologically resembles the diphtheria bacillus. It will immediately be said by some one that this may be the pseudo-diphtheria bacillus, and that the case is not true diphtheria, because the symptoms are so slight. As a matter of fact, there might be some truth in the assertion, but it would be unwise to place too much reliance on the possibility. There are two or three species of bacteria which closely resemble the diphtheria bacillus in morphology, so closely in fact that they could not be differentiated by a mere inspection of a stained slide. But these are found in inflamed throats in only two per cent of all the cases showing a supposed diphtheria bacillus. So the chances of the case being true diphtheria when a bacillus of this character is found are 98 out of 100. Besides all this, some of these pseudo-bacilli are

very readily differentiated by their cultural characteristics. Roux and Yersin consider the other so-called pseudo-bacilli, those in which inoculation experiments are necessary to establish their virulence, to be true diphtheria bacilli of attenuated virulence. This would make them analagous to the pneumococcus in the respect that they may vary greatly in their virulence and may even inhabit the mouths of healthy people without causing the disease. In explanation of the class of cases in which the bacteriologist finds virulent diphtheria bacilli, but which the clinician is loath to believe to be diphtheria, it should be remembered that there are mild cases of all diseases, but these mild cases are, as a rule, just as fruitful sources of contagion as the severe forms. Again, diphtheria bacilli may be present in the throats of people who are, or have recently been, in close proximity to the disease, and these latter may or may not be suffering from a simple sore throat, with which the diphtheria bacillus has nothing to do. An important point from a public health standpoint is the persistence of the bacilli in the throat after the disappearance of the false membrane. In the laboratory of the Board of Health of Philadelphia it was found that the average period of persistence of the bacilli in the throats of convalescents was 29 days. Sometimes they disappear as early as a week after the first detection, and in one case they were present as long as 112 days. So it will be seen that a secondary swab examination should be made at least once a week to determine when to raise the quarantine.

To sum up: The bacteriologic examination as a means of diagnosis in cases of suspected diphtheria, while not always conclusive on the first examination, is still the best means we have, and the



only means of determining positively, unless we wait for later constitutional symptoms and sequelae. The finding of the bacillus means, in 98 cases out of 100, true diphtheria. The absence of the bacillus is not such conclusive evidence that the case is not diphtheria, but repeated negative examinations are sure to indicate that the trouble is not diphtheria, and examinations should always be repeated if the first result was negative and the case still continues suspicious clinically.

### SEQUELAE OF DIPHTHERIA.

By WM. FITCH CHENEY, M. D., Professor of Principles and Practice of Medicine  
Cooper Medical College.

*Read before the San Francisco County Medical Society  
February 12, 1901.*

By the sequels of diphtheria are meant the diseases that come after it, as a consequence of it; not the diseases that occur coincident with it, which are more properly called complications. The true sequels of diphtheria are few in number, but exceedingly important. They are: (a) Disease of the blood; (b) Disease of the heart; (c) Disease of the peripheral nerves.

(a) Disease of the blood commonly follows diphtheria in the form of a severe grade of anemia. This is manifested clinically by pallor of the skin and mucous membranes, with muscular weakness and breathlessness on exertion, that delay convalescence for weeks. Blood examination shows simply a secondary anemia—considerable diminution in the number of red blood corpuscles and corresponding diminution in the percentage of hemoglobin. This condition is a direct consequence of the disintegrating action upon the red corpuscles of the diphtheria toxins circulating in the blood. Post-diphtheritic anemia is often persistent, but rarely a

serious menace to life. It calls for the usual remedies employed for secondary anemia, an abundant supply of nutritious food, oxygen by free exposure to fresh air, and the internal administration of some form of iron.

(b) Disease of the heart as a sequel of diphtheria is either the result of a myocarditis, occurring as a complication, or is one manifestation of the peripheral neuritis presently to be described. Endocarditis is a rare complication of diphtheria, and not often are the valves left crippled by this disease, as they are commonly enough by scarlet fever and various other infections. But the heart muscle, on the other hand, almost invariably suffers from parenchymatous or fatty degeneration to a greater or less extent, under the influence of the diphtheritic toxins circulating in the blood. This change in the heart wall at the time of the diphtheritic attack leaves the myocardium weakened in many cases for weeks afterward; and only too often it happens that some time after the throat has cleared and the patient has been discharged from regular observation, sudden death occurs from an acute dilation of the heart, following even some slight exertion, such as sitting up in bed or walking across the room. Or the development of the dilation may be more gradual. Holt expresses it thus: "It often happens that the patient is regarded as convalescent, and the great vigilance of the previous days or weeks has been relaxed. The physician has ceased his frequent visits, looks in only once a day to satisfy himself that the patient is doing well, and all congratulate themselves that the danger is over. If the pulse is carefully watched, it is one day discovered that it is weaker than formerly and occasionally there is slight irregularity. It is usually slower, but may be more rapid than nor-



mal. On inquiry, it is found that the patient does not take his food so well, that he has refused stimulants, and perhaps has vomited once or twice. Slight dyspnea is noticed, and the face is paler than usual. Sometimes within twenty-four hours after the beginning of such symptoms the patient is dead. Instead of such a rapid course the same symptoms may develop more gradually during three or four days, the significance of the earlier symptoms not being appreciated."

The best clue to the existence of such heart weakness following diphtheria is furnished by the pulse. This should be watched most carefully for several weeks after the acute infection has passed. The variations from the normal that should excite suspicion are: First, in the rate, which either remains persistently high after all fever has subsided, or else becomes peculiarly slow, falling in a young child to even 50 or 60 beats to the minute; second, to the rhythm, which becomes irregular and staggering, with occasional beats missed entirely; and third, in the force, the pulse becoming feeble and small. Any of these abnormalities means danger to life, and calls for prompt and vigorous treatment. The treatment of the heart weakness that occurs as a sequel of diphtheria consists first of all in rest. Children must not be allowed to get up too soon after this disease. Rest in bed should be insisted upon for at least one week, and better for two weeks, after the temperature has been normal and the throat is free from membrane. If the pulse, in spite of this rest, develops any of the variations from the normal above mentioned, whisky must be used freely and strychnin must be given regularly in full doses. By close watching, insistence upon prolonged rest, and prompt resort to stimulants in case of

need, sudden death from heart failure following diphtheria can be made a less frequent accident. Yet we are all apt to be misled by favorable appearances and to relax our vigilance prematurely.

(c) Disease of peripheral nerves is the most common sequel of diphtheria. Paralysis had long been observed to follow diphtheria with such regularity as to contradict the probability of mere coincidence, before an adequate explanation was at last offered of the relation between the two. In fact, there was lengthy controversy before the truth was at last established that disease of peripheral nerves is the true sequel of diphtheria, and the paralysis is only a consequence of this. Let us look at the various phases of the subject in detail.

1. As to the nature and cause of the disease of peripheral nerves occurring as a sequel of diphtheria: What takes place is an inflammation of the nerves,—a neuritis; and the cause of this neuritis is the toxins, manufactured by the diphtheria bacilli in the throat and absorbed thence into the blood. The proof of this is furnished, first, by autopsies on human beings, following diphtheritic paralysis, which have revealed inflammatory and degenerative changes in the nerve fibers supplying the powerless muscles; and, secondly, injection into animals of diphtheritic toxins produced in cultures outside the body, with resulting paralysis of muscles observed during life and the evidence of neuritis found after death.

2. As to the muscles affected by this sequel of diphtheria: (a) The ones most commonly involved are those about the throat, especially those of the palate and of the pharynx. In the majority of cases, this is the only form of paralysis observed. The evidences of this affection are difficulty in swallowing food, regurgitation of fluids through the nose



when drinking is attempted, and a peculiar nasal twang to the voice and indistinctness of articulation when the patient talks. (b) Paralysis of muscles about the eye comes second in frequency. The manifestations of this are blurred vision, from loss of power in the muscles of accommodation, double vision, strabismus, and ptosis. (c) Paralysis of the muscles of the legs and arms is not uncommon. Sometimes this results in complete inability to walk or to stand or to use the arms; but more often it stops with partial loss of power in the limbs. The knee-jerk is almost invariably lost, no matter how slight the paralysis of other parts. (d) Less common but far more serious is paralysis of the muscles of respiration, especially of the diaphragm, from involvement of the phrenic. This form of paralysis causes attacks of dyspnea, more or less severe, often accompanied by cyanosis; such attacks last for several minutes or several hours, tend to recur with increasing severity, and ultimately to cause death. Finally remains to be mentioned paralysis of heart muscle, due to a toxic neuritis of the pneumogastric or of the cardiac nerves. It is always difficult to say how much of so-called "heart failure" after diphtheria is due to changes in the myocardium and how much to changes in the nerves supplying the heart muscle. Sudden death may occur from either; the premonitory changes in the pulse are practically the same in each, and fortunately the same treatment that is indicated for one is equally indicated for the other.

3. As to the time of occurrence of this sequel of diphtheria, there is usually a considerable interval of convalescence between the subsidence of the symptoms of diphtheria and the onset of the symptoms of paralysis. Commonly the first evidence of paralysis is noted about four

weeks from the onset of the original disease; but the time may be earlier or later than this.

4. As to the relation between the severity of the diphtheria and the occurrence of paralysis, there is no proportion between the two. Paralysis is often the sequel of a mild attack of the primary disease, and sometimes ensues when the original sore throat has escaped attention, to say nothing of diagnosis. Paralysis of the palate bears the same relation to diphtheria that dropsy does to scarlet fever—the sequel settles the true nature of the preceding doubtful throat condition, as of the preceding doubtful rash.

5. As to the prognosis, the respiratory and cardiac forms of paralysis always offer serious menace to life; but when the paralysis concerns the muscles of the palate, the eye, or the extremities, the prognosis is always good, for there is no danger of permanent loss of function. Complete restoration of the muscles to their former power is the invariable rule after diphtheritic paralysis; but the time required for restoration is always long, usually six weeks or three months, and often as much as six or eight months.

6. As to the question whether treatment of the primary disease by antitoxin has power to prevent the occurrence of paralysis as a sequel, the answer is doubtful. Since antitoxin came into use, the most reliable statistics we have are those collected and reported by a committee of the American Pediatric Society, in 1896. This report included 3,384 cases of diphtheria treated by antitoxin; and out of this number paralysis was a sequel in 328, or 9.7 per cent. Regarding this point, the report says: "It is difficult from these statistics to state what protective power the serum may have over the nerve cells and fibers. Apparently this is not great unless the



injections are made early in the disease, and even then in severe cases the amount of damage done to these tissues in 24 hours may be very great, even irreparable." As to how this proportion of 9.7 per cent compares with the proportion of paralysis observed before antitoxin came into use, the report says: "Great discrepancy exists in the statements made regarding the frequency of paralytic sequelae after diphtheria. In a series of 1,000 cases reported by Lennox Browne, paralytic sequelae were present in 14 per cent. In 2,448 cases reported by Sanne, paralysis was noted in 11 per cent. In this series of cases reported to the American Pediatric Society, the difference is slightly in favor of the antitoxin treatment, but paralysis is certainly frequent enough still to show how extremely susceptible the nervous elements are to the diphtheria toxins."

7. As to the treatment of this sequel of diphtheria: For the ordinary forms, involving the palate, the eye, the limbs, the natural tendency is toward recovery, which takes place ultimately regardless of our interference, but probably more promptly in consequence of therapeutic measures. These measures include the use of strychnin and iron tonics internally, and the application of electricity externally—either the faradic or galvanic current, depending upon how the muscles respond; but the most valuable element of all in the treatment is time. While these forms of paralysis commonly recover whether treatment is vigorous or not, on the other hand, the forms involving the action of the heart and lungs too often end fatally in spite of every therapeutic effort. The measures to be employed in the treatment of respiratory paralysis are absolute rest and quiet, strychnin hypodermically in full dosage, and electricity applied to the respiratory mus-

cles by the faradic current. For threatened cardiac paralysis, the treatment is again complete rest, strychnin hypodermically, and alcoholic stimulants by mouth or under the skin.

### THE SPECIFIC TREATMENT OF DIPHTHERIA.

By GEORGE H. EVANS, M. D., President San Francisco County Medical Society.

*Read before the San Francisco County Medical Society  
February 12, 1901.*

Medical literature during the last few years has been so replete with statistics on the use of diphtheritic antitoxin, the journals have been so congested with reports of cases so treated and the wonderful results thus obtained, hospital bulletins throughout the world have given us so thoroughly comparative results with and without the use of antitoxin, that to fill this paper with figures would simply be to retail information with which we are all familiar, and, indeed, of which we have almost had a surfeit. In fact, so hackneyed has this subject become that I would scarcely have the temerity to present it were it not for reasons which make it appear pertinent to me that it should be viewed from a local standpoint.

The unreliability of statistics is well known to us all. A comparison of mortality rates emanating from any one institution or locality, as an argument for the value of a remedy, amounts to nothing, for figures are great liars when used in too limited and unintelligent a way; but when drawn from a sufficiently large number of facts, there are no such convincing truth tellers. Probably the most complete statistical report on this subject was that which a committee appointed for the purpose presented to the American Pediatric Society, at its eighth annual meeting, held in Montreal, in the spring of 1896. This report was based



on replies received in response to letters of inquiry from 613 physicians, residing in 15 states, the District of Columbia, and Canada, and recounted their results in 3384 cases of diphtheria treated with antitoxin, with an average mortality of 13 per cent. The most significant feature of this report was the difference in mortality dependent on whether the remedy was used early or late in the disease. Thus the lowest mortality was naturally seen in those cases treated on the first day of the disease, where it fell as low as four and nine-tenths per cent, then gradually increasing with each succeeding day, until, after the third day, the mortality rose rapidly, and did not differ materially from the mortality of cases treated by other methods. The larynx was involved in 1,256 of the cases, and of the laryngeal cases operated on (intubation and tracheotomy), the mortality was sixteen and nine-tenths per cent. As an interesting matter of comparison, of 5,546 intubation cases collected by McNaughton and Maddren, in 1892, before the days of antitoxin, the mortality was sixty-nine and five-tenths per cent. Other statistics, less reliable, because drawn from more limited sources of information, have from time to time since the fall of 1894 been given to us, until now, after over six years of use, I think there are comparatively few men to be found who have given the anti-diphtheritic serum a fair trial, and who have kept themselves informed as to the results of its use by others, who are not convinced that in this serum we possess a biologic antidote to the toxins of diphtheria.

Antitoxin has been used in San Francisco since the winter of 1894 and 1895 by a fair proportion of the physicians who treat diphtheria. A few weeks ago I sent out circular letters of inquiry to a number of these, hoping by this means to gain information of use in the prep-

aration of this paper. I have probably been as successful as most men who look for satisfactory replies to such letters; but while some reports have been full, the majority have been too meager to draw any intelligent conclusions from, other than that they have demonstrated the fact that every one who sent in a report is using antitoxin either in all or nearly all of his or her cases. I was particularly anxious to get reports from some of those who have had a very large mortality, but was disappointed in this respect, except in one instance, in which my correspondent admitted that he only resorted to antitoxin when the case "assumed a serious aspect." From November, 1897, to April, 1900, the San Francisco Board of Health distributed antitoxin to the physicians of this city, for the treatment of cases of diphtheria among the destitute poor. Of the physicians who applied for and received this serum, clinical records of 276 cases were received, of which 35 were fatal,—a mortality of less than thirteen per cent. That this mortality could have been reduced very materially had the serum been used in sufficiently large doses in some of these cases, and sufficiently early in others, the writer is thoroughly convinced from a careful analysis of the clinical reports on them, kindly placed at his disposal by the board of health. In only two of these fatal cases was the serum used on the first day; in four it was used on the second day; in four on the third day; in twelve on the fourth day; in seven on the fifth day; in one on the sixth day; in one on the tenth day; and in four cases the disease had been present for an uncertain period. That a great many cases do not receive the remedy before the disease is well advanced, is unfortunately beyond help, particularly among the poor, who, through their



poverty and carelessness do not call a physician early; and it is in this class that for obvious reasons diphtheria is most common. But is not the medical man culpable who, when called at any stage of the disease, neglects to give the serum in a sufficiently large dose, if substantial arguments can be brought forth to show the harmlessness of the remedy? And does his ultra-conservatism, or his doubt as to the efficacy or harmlessness of it, absolve him from all responsibility in the event of a fatal termination?

What is a sufficient dose of antitoxin? The antitoxic unit is not a measure of quantity of serum, but of potency. As the toxic unit is a measure merely of toxicity, or power to destroy life, so the antitoxic unit is a measure of power to save life. An antitoxic unit is ten times the measure of potency which will neutralize ten toxic units in a half-grown guinea-pig. An antitoxic unit, therefore, has the antidotal power required to protect against one hundred toxic units. Could we estimate the amount of toxins present in an individual suffering from diphtheria in toxic units, the amount of antitoxin necessary to be administered would be clearly indicated. Such not being possible, our only indication as to the necessary amount is the clinical appearance; and right here I wish to enter a plea for those apparently moribund cases, where we have been satisfied in giving an ordinary dose of the remedy, more for the moral effect upon ourselves than for any hope of relief to our patient. McCollom, of Boston, urges that it must be given until the characteristic effect is produced on the membrane. He usually begins his treatment with 4,000 units, and continues giving it until he gets shriveling of the membrane, diminution of the nasal discharge, correction of the fetid odor, and a general improved condition of the patient, giv-

ing in some cases as high as 60,000 or 70,000 units with good results. In fact, he mentions the great reduction in the mortality of the apparently moribund cases since these larger doses have been given. Four thousand units as a minimum dose; and yet in only six of the thirty-five fatal cases in the series reported to our local board was as large a dose used. Year by year the tendency has been greater to give larger and larger doses, as the fear of the remedy became less. When its use was first begun, 800 units was considered a fair dose, until now 4,000, 5,000, and 6,000 units are given at one dose with absolute impunity; and I find from communications I have received in answer to my letter of inquiry, that those physicians in San Francisco who are doing the most work in this line are giving the larger doses, one writing me that he repeatedly gives from 9,000 to 15,000 units to children between five and eight years of age during thirty-six or forty-eight hours. Particularly should this large dosage be observed in cases involving the nares, where the area involved is problematical, in laryngeal cases, and in cases of mixed infection, or septic cases. In such cases, 3,000 or 4,000 units should be considered the minimum initial dose. Unquestionably the fear of deleterious effects from large doses has prevented their application in a large number of cases. There can be no question that the erythemas and joint affections seen so frequently following its administration are due to ingredients in the serum of the horse other than the antitoxin. Erythematous eruptions probably occur in about fifteen per cent of all cases treated with the serum. They are usually quite evanescent, rarely lasting more than two or three days. They are usually general, but may be local, the writer having



seen within the last three weeks three cases of simple erythema, in each case limited to the arm in which an immunizing dose of serum had been injected, and coming on a week after the injection. Efforts have been made of late toward the elimination of these irritative substances by filtration of the serum or precipitation of the antitoxins, assuming them to be globulins or globulin-like substances. In the latter direction Atkinson ("Journal of Experimental Medicine," November, 1900) and Park ("Archives of Pediatrics," November, 1900) have done considerable work in the "Research" Laboratory of the New York Board of Health, but with no success, and Park concludes "that the antitoxins can not, with our present knowledge, be separated from that portion of the blood serum, which, in susceptible persons, produces disagreeable effects." The majority of the other deleterious effects from the use of antitoxin deserve no more than a passing notice. Arthralgias occur occasionally, but are of short duration. An increase in fever has been noted. In a case occurring in the practice of Dr. Wakefield, of Oakland, who kindly gave me the clinical history, and in which 53,000 units of antidiphtheritic serum had been used, together with considerable antistreptococcic serum, the temperature curve ranged from 104.3 to 108, but whether this hyperpyrexia was due to the serum or not is impossible to say. Certainly large doses of serum do not necessarily increase temperature, for in one of the cases reported to our local board, in which 17,000 units had been used, the temperature promptly fell to normal. Albuminuria is said to follow its administration, but as so many cases of diphtheria are accompanied by albuminuria, this can hardly seriously be taken into consideration as a sequel of the use of antitoxin. If abscesses at the

site of injection do sometimes occur, few men in these days, when physicians are supposed to be cleanly in their work, will care to report any such results. Among less common results occur adenitis of the groin, axilla, and neck, mucus diarrheas, and herpes zoster.

Since the introduction of antidiphtheritic serum, there has been an apparent increase in the number of cases of paralysis following this disease. Here again we find an illustration of the notorious unreliability of statistics. Baginsky, of Berlin, stated in a discussion on diphtheritic paralysis, at the Edinburgh meeting of the British Medical Association, that his experience led him to believe that the number of cases of paralysis was less now than formerly. There can be no question that the incidence of paralysis in hospital cases will vary in different hospitals with the average duration of a patient's stay. With patients kept in hospital five weeks or longer, experience shows that since the introduction of antitoxin, the paralysis rate has gone up. The reason usually given, and a very probable one, is that more severe cases survive the early and fatal stages of the disease, and either recover or live sufficiently long to become paralyzed. Osler describes this paralysis as a toxic neuritis, due to the absorption of the toxins. If this be true, then one would expect that the larger the quantity of toxin absorbed, the more likely would paralysis be to follow. Both clinical and experimental evidence support this view. Quoting from the "Journal of Pathology and Bacteriology," July, 1900, Ransom, in Behring's laboratory, carried out a series of experiments on guinea-pigs with diphtheritic toxin and antitoxin, with the purpose of testing the influence of antitoxin as a factor in the causation of paralysis. His conclusions are as follows: (1) Paralysis



may certainly be expected after intoxication with not less than one-fourth of the minimum fatal dose. With doses between one-fourth and one-eighth, paralyzes occur, but are not constant, and below one-eighth no paralysis was noticed. (2) The larger the dose of toxin, the more severe will be the paralysis, if the animal survives long enough. (3) Neutralized mixtures of toxin and antitoxin, containing only about one lethal dose or less, do not appear to cause paralysis. (4) Antitoxin given fifteen to twenty-two hours after intoxication with doses of toxin not greater than the lethal dose, exercises in large doses a mollifying influence on the subsequent paralysis. This influence is more evident with smaller doses of toxin than with such as are but little less than the minimum dose. Small doses of antitoxin have no evident effect in diminishing the paralysis. (5) Transferring these results to practice among human beings, we may expect liberal doses of antitoxin given early in the illness to influence favorably the subsequent paralysis; and this beneficial influence is likely to manifest itself not so much on the local paralyzes as on such symptoms as failure of the heart. Severe cases are, however, likely to be followed by some paralysis in spite of even large doses of antitoxin. Referring again to the thirty-five fatal cases reported to our local board, no less than twelve unquestionably had paralysis, judging from the clinical reports sent in; and ten of them died of cardiac paralysis, most of them several days after the use of the serum, and after all membrane had disappeared. The majority of them were treated late in the disease, and small doses were used in every case, 4,000 units being the largest; and in one case, that of a child of three years, in which there was involvement of both tonsils, uvula, and pharynx, a dose of 500

units was used after the disease had been present four days. The child died of cardiac paralysis during convalescence.

When should the treatment be begun? Should we use antitoxin in every case of sore throat? or should we go to the other extreme and use it as a "dernier resort," or only in severe cases, or when the microscope has confirmed the diagnosis? Conceding the harmlessness of the remedy, its cost would make the universal acceptance of the first proposition impracticable, and impossible of fulfilment among a large proportion of the people where diphtheria is found to be most prevalent. Unquestionably improved facilities for its preparation will in the future very materially lessen its cost; but it will undoubtedly always remain an expensive preparation, and unfortunately be beyond the reach of a large number of those who require it, unless municipal boards of health can be given the necessary appropriation to furnish it to this class. This was done here for a time as alluded to above, and it was unfortunate that the city fathers in their wisdom did not see the way to continue its distribution. Aside from its cost, however, I do not think it wise, nor would the public take kindly to its indiscriminate use in all cases of sore throat. To wait for a bacteriologic diagnosis is, however, to err at the other extreme. While I would yield to no man in my grateful acknowledgment of what bacteriology has done for us in the scientific recognition of this disease, I am thoroughly convinced that many fatalities occur because we rely too implicitly on laboratory diagnoses, and particularly is this so in some of the laryngeal forms, where no membrane is visible, and where repeated efforts fail to produce any growth on culture media. The writer has seen such cases, and it is undoubtedly an experience common to



most physicians. Diphtheria was recognized with a fair degree of accuracy before the universal use of the microscope, and it is on the clinical symptoms alone that the indications for the use of antitoxin must be determined. Antitoxin and an appropriate syringe should be part of every physician's armamentarium, and in the presence of any suspicious exudate, the serum should be used, and then a culture made. R. W. Marsden, in a recent article in the "British Medical Journal," very aptly says: "It is in these days a mere waste of time to bring forward facts solely with the idea of proving the inestimable value of antitoxin in the treatment of diphtheria. Its detractors are few, and of necessity largely inexperienced in its practical utility; for no one who has treated diphtheria by the old method of local disinfectants and general tonics, and then observed the marvelously regular improvement after the early administration of antitoxin, could for a moment doubt its specific nature.

807 Sutter Street.

#### **CASEOUS DEGENERATION OF THE MEDIASTINAL GLANDS; OPERATION, RECOVERY.**

By W. S. THORNE, M. D.

*Read before the San Francisco County Medical Society, March 13, 1900.*

A Spanish girl, aged 14, entered St. Mary's Hospital in September, 1899. She was delicate looking, and quite undeveloped; had a sharp, dry cough and a daily rise of temperature, reaching 103 degrees in the evening; breathing difficult, and not explained by the condition of the lungs. The respiratory sounds were normal, save at the apices, where it is rude and broncho-vesicular; no alteration in the percussion notes. Percussion over the sternum and costal

cartilages elicits dulness, which suddenly passes into normal resonance as you pass outward. The respiration is labored and difficult, as though obstructed. She has been ill since June. She is very nervous and irritable. She has menstruated for a year at intervals. Diagnosis of abscess of the anterior mediastinum. Under ether, an opening was made in the center of the sternum large enough to admit the finger. A soft mass was detected beneath the sternum, and the opening gave exit to several ounces of bloody fluid. The opening was enlarged, and a cupful of caseous substance was removed. The cavity was thoroughly cleaned of its contents by a blunt curette, and cleansed with hot sterilized water. The movement of the heart could be seen and felt during the operation, and at each pulsation a quantity of blood was ejected through the opening. The cavity involved the anatomical boundaries of the anterior mediastinum. The dressing consisted of gauze, packed loosely beneath the sternum. The evening temperature fell to 100 degrees the day following the operation, and at the end of the week it was normal. The cough and difficult respiration ceased entirely within a day or two, and the general condition appeared normal at the end of the second week. The wound was cleansed and packed daily. The medication consisted of cod-liver oil and iron. The child was removed by her mother to the country in the fourth week, the cavity giving rise to but little discharge, and the opening unclosed.

The chief points of interest in this case are the immediate relief of the urgent symptoms, by the removal of pressure, and our inability to locate a tuberculous lesion of the lungs, of the neighboring glands, or elsewhere. The



extreme rarity of idiopathic lesions of this region leads us to assume the existence of tuberculous deposits somewhere, probably in the lungs, although the physical signs were by no means conclusive. I do not think this case presents an example of a primary lesion of the mediastinum. Caseous glands of the anterior mediastinum of children have been found in 110 cases out of 300 autopsies made at the Children's Hospital, London. There is an unexplained predilection of the anterior mediastinum to take on diseased conditions, especially in connection with diseased glands. Indeed, upon anatomical and theoretical grounds we might expect the greater frequency in the posterior cavity, since these glands form a more intimate and direct connection with the deep cervical glands than do those of the anterior mediastinum. Hare has observed but does not explain the greater liability of the anterior mediastinum to diseased conditions in the proportion of 48 to 19, and that abscess is nearly as frequent as cancer. Dermoid of this region has been observed in one case.

The diagnosis of disease of the anterior mediastinum is based on the evidence of pressure on the pneumogastric and recurrent laryngeal nerves, as evinced by difficult breathing, dry and stridulous cough, weight over the sternum, and dulness on percussion over the region involved, and in extreme cases, bulging of the ribs. Early and exact recognition of diseases, notably abscess of the anterior mediastinum, is important, owing to the liability of rupture into the serous cavities, resulting in pleuritis, pericarditis, and peritonitis.

H. Milton, in the *Lancet* for March, 1897, proposes a very heroic method for the removal of tuberculous glands of the anterior mediastinum. He saws through

the entire length of the sternum from the notch to the xyphoid cartilage, packs with gauze for 48 hours, and then closes the wound. We may reasonably assume that abscesses or tuberculous glands of so extensive an area, as the anterior mediastinum, are in no condition to be shut off from farther attention at the end of 48 hours. J. McFadden Gaston, in the *Medical News* for November, 1896, proposes a trap-door of the chest walls for extensive operations of the chest cavity, as follows: He saws through the wall of the chest from the 3d to the 8th rib in the axillary line, then transversely cuts through the soft tissues to the sternum, divides the costal pleura with scissors, and lifts the rectangular door thus made towards the sternum, the cartilages acting the part of hinges. Statistics of J. McFadden Gaston's operation are not appended.

815 Sutter Street.

## HOSPITAL REPORTS.

Gynecological Clinic, Cooper Medical College, Geo. B. Somers, M. D., in charge.

*Reported by Minora E. Kibbe, M. D.*

### CARCINOMA UTERI.

Hospital Case No. 92. Single. Age 34. Telegraph operator, American, menstruation regular, painless, and moderate in amount. Leucorrhea, which often has an offensive odor, has been present for a long time. Present illness began two years ago with a dull, constant, throbbing pain across the back. At times the pains are sharp and shooting. A burning sensation in the vagina and a dragging sensation in the pelvis are also complained of. When taking a douche, the introduction of the nozzle has often caused bleeding. Lately there has been pain in the left hip and groin extending downward to the knee. Bimanual examination shows normal outline of uterus and cervix wholly absent. Instead, a hard, jagged, adherent mass is felt, which bleeds easily. An uneven and ragged area extends well down to the left side of the vagina. Considerable pain upon pressure in this region is experienced. Rectal examination shows the uterus retroverted, hard, enlarged, tender, and adherent. Examination of the hip shows a point midway between the great trochanter and the tuberosity of the



ischium on the left side tender to pressure. A space three to four inches long and two and one-half inches wide about the middle of the outer side of the left thigh is also very tender. Operation Oct. 8, 1900. The abdomen was opened and the uterus with cervix and appendages completely removed, working from left to right, according to Kelly's plan. On the left side, where the broad ligament is attached to the pelvic wall, two nodular masses were felt and dissected out. These proved to be metastases, and were probably diseased iliac glands, and it is possible that the pains in the left hip were due to them. After removal of as much diseased tissue as could be detected, the bleeding edges of the opening into the vagina were tied with heavy silk left long. The ends were pulled down through the vagina, thus acting as drains. The peritoneum above was brought together over the raw surfaces, the pelvic cavity then flushed with salt solution, about a pint being left in, and the abdomen closed in three layers. Pathology. Report by Prof. Wm. Ophuls: "The bottom of the large superficial defect on one side of the cervix is partly covered with high, cylindrical epithelium, from which more or less tubular, irregular, gland-like structures run into the cicatricial tissue underneath. The fibrous tissue is rich in capillaries, and in some places also very rich in cells, mostly fibroblasts and lymphocytes. Further down in the tissues there are even more irregular, gland-like structures, with several layers of epithelial cells on their walls. In some places the epithelial cells are so plentiful that they fill up the lumen completely. A good number of the epithelial cells, especially those in the center of the alveoli, contain minute fat droplets. The separate nodular mass consists entirely of granulation and cicatricial tissue, in which there are irregular spaces, filled completely with polygonal or spindle-shaped, moderately large epithelial cells." Remarks: Recovery from operation uneventful. The pain in left hip was much relieved, but not entirely cured. General health at this date, four months after operation, good. Last examination showed small hardened mass at the vault of vagina, which is suspected to be a recurrent. Patient at present in Nevada, under care of family physician. The special features of the case are the age and the fact that the patient was unmarried.

#### ECTOPIC PREGNANCY.

Case 2906. Mrs. M., aged 28, four children, four miscarriages, last one occurred in April, 1900. Menstruation irregular of late. In November, period was unusually scanty. In December, flowed constantly in small amounts. In latter part of December, Dr. Mary Halton, who had charge of the case and followed it closely, found that a piece of tissue had been passed per vaginam. From a microscopic examination she diagnosed extra-uterine pregnancy, and referred the case to the clinic. An examination showed the

uterus in normal position, the cervix soft and low down, presenting an old laceration. In Douglas' pouch and extending over to left side was an extensive boggy mass of irregular outline, somewhat nodulated. Depth of uterus 8 cm. Operation January 16. Median abdominal incision. The pouch of Douglas was found filled with a mass about the size of an orange, of a dark-blue color, covered with a thin membrane, soft and boggy. The Fallopian tube ran over the tumor, while the ovary was beneath and to the inner side. The right ovary was the seat of a cyst as large as a lemon. As no sound ovarian tissue could be found here, this cyst was removed at once, in order to provide more room. In removing the mass from the left side, the adhesions were easily broken up in front and at the sides, but posteriorly it was firmly attached to the sacrum. From this position it was peeled off with the fingers, and in so doing, the tumor was opened, displaying at once the characteristics of extra-uterine pregnancy. The point of attachment of the fetus, whether in the tube or external to it, could not be made out.

#### MULTIPLE FIBROMATA OF UTERUS.

Clinic Case No. 2892. Married 3½ years. Aged 37. Seamstress, American. Patient has always been in poor health, with poor digestion and lack of energy. Several of her father's people had died of tuberculosis. Four years ago had operation for appendicitis. She was led to consult a physician because of extreme depression, loss of flesh and lack of vitality, together with metrorrhagia. For some months has flowed every two or three weeks, and last October flowed four times during the month. Has never been pregnant. Physical examination shows uterus in normal position, only a little enlarged, but having several fibroids upon the surface; cavity 8 cm. deep. Operation Jan. 10, 1901. The uterus was first thoroughly curetted, removing much hypertrophied gland tissue. After the method of Duhrssen, an inverted, T-shaped incision was made in the anterior vaginal wall. In separating the bladder from the uterus, a fibroid the size of a cherry was met projecting into the cellular tissue and tied off. The peritoneum was then opened, and the uterus pulled through the opening into the vagina. Two more fibroids, the larger the size of a walnut, were removed from the fundus. The sites of the excisions were sewed with continuous catgut sutures. The uterus was then pushed back into normal position, the vagina closed with silkworm gut, the anterior surface of the uterus being included in the first three vertical sutures. Remarks: The patient was practically well in two weeks. Small fibromata may be easily removed through the vaginal incision and this route is to be preferred in such cases, owing to lessened risks. In this case the fundus of the uterus was easily brought into the vagina, even though the woman was nulliparous.



# Occidental Medical Times

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## THE MEETING OF THE MEDICAL SOCIETY OF THE STATE OF CALIFORNIA.

The Medical Society of the state of California will hold its regular annual meeting on April 16, 17, and 18, at Sacramento. It is earnestly hoped that the attendance will be an improvement on last year, as matters of importance will come before the meeting.

The chairmen of the various sections have reported that a good number of papers have been promised by members throughout the state.

Recent events before the Legislature have very forcibly demonstrated the fact that more unity of interest and purpose is demanded of the profession in this state; that an almost total indifference to questions, seriously threatening our standing before the world and our integrity at home, pervades the whole medical body; and that the open and flagrant use of power and influence by members of this society against measures advocated by it deserves serious consideration. It was frequently urged in the debates on the bill for the establishment of a Board of Medical Examiners that the societies, and especially the State Society, were not representative of the profession. Numerically this possibly is true; but when we consider the material which constitutes this body, we say emphatically that from a professional and intellectual standpoint its representation is of the first quality. When it is further considered that these arguments were inspired by men who should have the interests of the profession at heart, we

deem their action in this matter most unworthy and contemptuous. That the society should be larger is not doubted. There is ample material in the state; but it is left to men, such as above referred to, to impede progress of every kind, while sailing under the protection of a profession, whose honor they degrade on all occasions that do not appeal to their own financial or professional aggrandizement. Some effort to build up the society, not, however, because of these charges, is not only commendable, but necessary. If each member would put forth a little energy and urge his neighbor to lay aside his work for a few days, that he might meet his fellow practitioner in the discussion of matters of great benefit to all, the meeting at Sacramento would become memorable for a large attendance and possibly for the large number of names that can be enrolled.

## THE PACIFIC COAST MEDICAL ASSOCIATION.

In the December issue of the "Pacific Record of Medicine and Surgery" for 1898, an association to bear the above title was proposed. During the last year, and possibly entirely without reference to the above, the question was again considered, and has culminated in the formation of a temporary organization in San Francisco, working with similar bodies in the states of Washington, Oregon, Montana, Nevada, Utah, and the territories of Idaho and Arizona, etc. The suggestion so far has met with much favor. Prevailing opinion seems



to convey the idea that, with the expansion and advance of national and local interests, the time is opportune for the extension of medical influence of the different coast states to one another, thereby building up professional and scientific relations in keeping with the general progress of affairs.

The proposition seems to be a good one. We need the stimulus of contact with strangers and opposition. We are unfortunately so situated geographically as to be cut off from quick contact with the east, are to a degree isolated, and in order to keep astride of the advance of medicine, an incentive other than the ordinary relations with our fellows is needed. Daily communication, unless carefully guarded by energy and activity, brings about a lethargy, a feeling of self-content, and of being equal in every respect to our neighbor that is not conducive to progress. This too common indifference, this want of ambition, needs new relations of life for eradication. No man has ever left his state, his country, without returning, after meeting strangers, with a determination to improve. The prime object, then, of this movement is scientific improvement. It also aims to bring about a healthier professional feeling in the states and between the states; to bring men into contact; and to build up a brotherhood on the coast that will advance personal and professional knowledge and friendship.

The most serious objection urged is that it will injure the state societies. This is a mooted question. The history of similar organizations disproves this claim. The state societies of the states comprising the Mississippi Valley Medical Association, the Rocky Mountain Medical Association, etc., have increased in membership, in energy, and in the scientific value of their papers and proceedings, since the

organization of such bodies. Letters from the presidents and members of these societies are highly in favor of the energy infused in the local bodies and of the better professional feeling pervading the whole medical fraternity since these organizations have come into prominence. Certainly the Mississippi Valley Medical Association is a worthy and flourishing example. In this connection it should be remembered that this proposal received its greatest impetus at the last meeting of the Oregon State Medical Society, and in order that no conflict will arise nor any injury be done to the State Society, a resolution asking its cooperation will be presented in April. Such an organization as is proposed can not injure our county societies, and the only possible effect that it would have upon the state societies would be to stir up and give energy to greater efforts in their behalf. If it accomplishes this, it will do good. Opposition fairly and honestly given has never been a detriment in any phase of life.

The essential point on which the success of such an association depends is the requirements for admission. It is supposed by many that this association is to be an "open door" affair, a refuge for the disgruntled and the disaffected; but this can scarcely be true, considering the character and number of members belonging to the state and local society who have already given their support to the cause. The requirements for admission are to be as high and as carefully scrutinized as those for admission to the state and county societies. Only regular, worthy, reputable men can secure admission. A committee of three will constitute a board for their respective states, who will act in conjunction with those of all the states, at the annual meeting. The requirements



proposed by the California branch are those of the Mississippi Valley Medical Association, which read as follows:—

"Membership in this association shall be limited to members of the medical profession in good standing. No one under sentence of expulsion, suspension, or other disability in any regularly organized state, county, district, or local medical society shall be eligible to membership in this association during the existence of such disability. All applications for membership shall be made through the committee on credentials."

#### THE NEW MEDICAL LAW.

It should be a matter of congratulation to the profession of the state, and especially to those of the committee who have labored so earnestly in its behalf, to know that the bill giving existence to a state board of medical examiners has recently passed the Legislature and awaits the signature of the Governor to make it a law. This measure will bring great good to the profession and many benefits to the people. It may not be as perfect as we desire, but with the help of homeopaths and eclectics and firm adherence to its requirements, it will keep out a very undesirable class and aid immensely in building up the reputation and standing of our profession.

#### NOTES.

##### DR. REGENSBURGER'S RESIGNATION.

In our issue of January we stated that Dr. A. E. Regensburger had resigned from the faculty of the College of Physicians and Surgeons. His name is still on the list, while those of his fellows who took the same step have been erased. An explanation is certainly in order to make it clear to the profession whether we erred in our statement or not.

#### LANE LECTURES.

The nineteenth annual course will be delivered in the auditorium of Cooper Medical College, Sacramento and Webster Streets. Lectures begin at eight o'clock. The subjects will be as follows:—

Friday evening, Jan. 4, "The Golden Gate Park," Dr. L. C. Lane; Friday evening, January 18, "Physical Exercise," Dr. Stanley Stillman; Friday evening, February 1, "How to Prevent Disease in Children," Dr. William Fitch Cheney; Friday evening, February 15, "Bacteriology and Medicine," Dr. William Ophuls; Friday evening, March 1, "The City's Sewerage," Dr. C. N. Ellinwood; Friday evening, March 15, "Civilization as a Cause of Mental and Nervous Disorders," Dr. A. M. Gardner; Friday evening, March 29, "The Doctor among the Painters (illustrated), Dr. Emmet Rixford; Friday evening, April 5, "Doc and Doctor," Dr. Geo. F. Hanson; Friday evening, April 19, "The Blood in Health and Disease," Dr. J. O. Hirschfelder; Friday evening, May 3, "Sea Air, Sea Water, and Health," Dr. Henry Gibbons, Jr.

## SOCIETY PROCEEDINGS.

### CALIFORNIA ACADEMY OF MEDICINE.

Regular Meeting January 22, 1901.

In the absence of Dr. D. W. Montgomery, Dr. H. M. Sherman occupied the chair.

#### ARSENIOUS ACID IN SUPERFICIAL CANCERS.

Presentation of cases. Dr. H. Morrow presented several cases from Clinic "Diseases of Skin," Medical Department, University of California, showing the result of arsenious acid in the treatment of cancer of the skin. Case 1. Man who had been injured on the nose by a hook 10 years ago. The sore was a large one, extending from the lower end of the nose to the lower portion of the frontal bone, deep and ugly, with white surface of the bone showing an area of 1 by 2½ inches. He was still under treatment. When treatment was begun,



there was no evidence of bone. Paste has been applied five times, 24 hours for each application. Only a part of each border was treated at a time. After the first treatment, the patient failed to report as directed, and, when seen, there was extensive edema, pain, eyes were closed and face much swollen for three days. Bones are now protruding, and a portion of them dead. Case 2. A man with syphilis in the secondary stage, with the eruption well marked on forehead and chest. There was a seborrhoic eczema on back. Histological specimens were demonstrated. Cases 3, 4, 5. Three men presenting results from the use of the paste. The scars are very small and the results excellent.

In the absence of Dr. Montgomery, Dr. Morrow read their paper entitled "Arsenious Acid in the Treatment of Cancer of the Nose and Face." (See page 49.)

Dr. T. W. Huntington: "The results shown in these cases are highly satisfactory; but, so far as I can see, not more so than where resort has been had to the knife. It is probable that the degree of malignancy in these superficial lesions is of a lower type than in many kindred affections. My own personal experience in the use of escharotics has not been reassuring, but this method of treatment is clearly applicable in those cases where other surgical methods are declined."

Dr. Hunkin has treated several cases with formalin by brushing it over the surface. There was a great deal more pain than where the paste was used. Several cases seem to have gone on with questionable results, the disease spreading over nose and forehead. The cases shown probably are not truly malignant. The tendency to malignancy usually increases with age.

Dr. Morrow: "Two of the cases presented here to-night refused the use of the knife and were kept under treatment by the use of arsenic. A woman recently called at the clinic who had an epithelioma of the under lip, and was advised to have it removed by surgical means. She refused to have it cut out, and never returned to the clinic. That arsenic has a selective effect on cancerous tissues is well shown by its action on these growths. We believe that this has been made evident by the microscopic demonstration of the infiltrated areas."

Dr. Taylor: "The last remark of Dr. Morrow that the effect of arsenic is shown on the infiltrated tissues is not true. The infiltration is removed by the effects of the paste on the circulation and by cutting off further infection. The difference in diagnosis between the infiltrated and cancerous tissue must be made clear and distinct. All infiltrated tissue around a cancerous area is not cancer."

Dr. Morrow: "In one case an enormous slough, one inch wide and quite deep, came away, showing that there must be some selective action of the arsenic. This slough could not be due to chronic inflammation. In many cases of chronic pustular infiltrations the arsenic paste has been used, but we have had no results."

Dr. D. W. Montgomery said: "The cases presented here to-night are of a kind that used not to be looked upon as being cancer. They were called rodent ulcers, and their cancerous nature was denied, because they do not grow rapidly and have very little tendency to form metastases. They are cancers, however, and even occasionally form metastases. Arsenious acid seems really to have selective action on cancerous tissue."

#### SPINA BIFIDA.

Doctor Sherman exhibited, as a specimen, a spina bifida tumor that he had removed. He had made lateral skin flaps, dissected down to the neck of the tumor proper, ligated and cut off. In doing this some of the nerves had been cut off, but none that had any physiological continuity, for the child was able to move the limbs as much after the operation as before. He thought that the nerves that were spread out in the parchment-like dome of this tumor were lost there, and did not conduct impulses in either direction. The wound in the child's back had healed per primam intentionem. Postscript, Feb. 7, 1901. The memorandum that the wound healed per primam intentionem is misleading at this date, for the cicatrix is now the seat of another cyst. The ligature that had been put on the neck of the sac slipped off, because the sac was cut off too close to it. To repair this damage, a flap of fascia was turned up from the lumbar muscles, folded over the opening, and stitched closely to its edges. The whole wound was then united from the bottom to the top by tiers of buried sutures, and the skin was closed by a subcuticular suture. This held very well for about three weeks, and then the cyst began to form in the deeper parts. The cyst was aspirated, 34 cc. being removed, and 1 cc. of Morton's fluid was injected. This has been of no benefit, and the cicatrix has broken open in one place, and there is a leak of cerebro-spinal fluid. The child's general condition is very good. Doctor Sherman also reported a case, which had a large tumor, chiefly of fatty tissue, associated with a spina bifida. On the apex of the larger had been a smaller fatty tumor. The cyst had been originally aspirated and injected with Morton's solution of iodine in glycerin and iodide of potassium. After this the tumor shrunk about 25 per cent of its size. A second attempt to aspirate failed to find the cyst. The child became marasmic, and was sent home. At home he improved in health and later was returned to the hospital for the removal of the tumor, which was mechanically a detriment. The operation disclosed the fact that the cyst had disappeared, its place being taken by some rather dense fibrous tissue, but in the center of the neck was a small opening communicating with the spinal canal. In this case the most careful closure of the wound by tiers of sutures failed to prevent some cerebro-spinal fluid leak. He would not recommend Morton's fluid in those cases that were not wholly covered by skin. He



doubted if the iodine entered the spinal canal, the opening at the neck of the tumor is too small, and there is no current, no flow, that we know of in the cyst contents. Before injecting the iodine, a part of the cyst contents is removed, so that at no time is the tension of fluid in the cyst increased. In small, skin-covered tumors Morton's fluid may be advisable. If after the use of the fluid and the collapse of the sac the mass is still cumbersome its removal is the best plan.

Dr. Hunkin thinks that the fluid must enter the canal to some extent, but as the canal is a mere cavity, there is little danger of damage to the nerves.

Dr. Sherman still thinks that the neck is so small as to cut off any great amount of fluid from entering, especially as there is no current in the spinal fluid.

### SAN FRANCISCO SOCIETY OF EYE, EAR, NOSE, AND THROAT SURGEONS.

Regular Meeting January 24, 1901.

Henry L. Wagner, M. D., president, in the chair.

#### CONGENITAL ARRESTED DEVELOPMENT OF THE FUNDUS.

Dr. A. Barkan presented a man, aged 32, single, teamster, the subject of congenital arrested development in the fundus of each eye. Has had a good education, and, so far, no difficulty in reading with the right eye, and complains only of bright sunlight. Health is perfect. There is nystagmus horizontally, which is increased when an object is fixed straight ahead. When turning the eyes to the right, they become fairly steady. There is also nystagmus upward, downward, and straight ahead, and the patient is unable to move the right eye beyond the meridian line towards his nose, showing faulty development or paralysis. The left eye can not be moved but a little beyond the meridian line, and not into the outer angle. The right eye is fairly well shaped on outer inspection. Media clear; fundus shows centrally atrophic patches in the choroid; optic disc elongated, with deep excavation adjoining it on the temporal side. The change from the plane of the disc to the excavation coloboma is abrupt, and the latter is deep. The left eye is small in all its dimensions. That is strikingly so with regard to the cornea, which, though quite small, probably half the size of the other, is well formed in other respects. An examination with Javal is very difficult, owing to the nystagmus, but shows considerable astigmatism against the rule, and some irregular corneal astigmatism. Dr. Barkan has found it impossible to see details in the background of the left eye distinctly, but there is a polished spot, corresponding probably to the posterior staphyloma, in the other eye, and some dark pigmentations in the choroid. Vision in the right eye is nine two hundredths. He reads, with the eye turned into

the outer angle, Snellen .5 with some difficulty in six-inch distance. Vision in the left eye is about four two-hundredths. Can read with that eye a few letters of the largest print of Snellen. Convex glasses are rejected altogether, and concave glasses seem to produce no improvement. The interesting feature of this congenital arrested development and the defects in the fundus of both eyes is that the patient is one of seven in family. His brothers and sisters all enjoy perfect sight. On his mother's side, eyes have always been good. On his paternal side, the patient's grandfather, and again, the latter's grandfather, have had the same defective eyes. Thus in four generations the same developmental trouble occurred twice, with one generation always intervening. Another interesting feature is that the patient has no trouble in his occupation as teamster, driving through crowded streets and attending to all the duties of his position.

#### MYXO-FIBROMA OF NOSE AND PHARYNX.

Dr. F. B. Eaton presented a specimen of myxo-fibroma of nose and naso-pharynx, and stated that it is the largest one he had ever heard of, but supposed that there are perhaps others that are larger of the kind. The patient was a young fellow, about 23 years of age. He was emaciated when seen at the hospital, and on opening the mouth this large tumor was seen extending down behind the pharynx, and at times hung down over the epiglottis. It was impossible to get the finger above the palate without using great force, the tumor filling completely the naso-pharynx and pharynx. Dr. Eaton first attempted to cut the tumor off with snare armed with number 5 piano wire. He soon broke the wire. However, he cut off a piece about the size of the present specimen, and afterwards in his office, with a galvano-cautery snare, snared out the mass presented. This left the base, which occupied a portion of the roof of the naso-pharynx, and a portion of the middle turbinate near its posterior end, and a portion of the middle meatus of the nose, comprising about one-third of the middle turbinated bone on its under side. A cautery electrode strong enough for the purpose was passed it into the fossa, meeting it with the forefinger above palate, and with it the base was destroyed little by little with moderate hemorrhage. The young man improved very much. He gained some twenty pounds in weight; but he returned a few months later, having a return of the growth in his nose: that in the nasal pharynx never grew again. It was burned again in the same way. There was now always considerable hemorrhage. Patient was 23 years of age, and Dr. Eaton was working to keep him alive until he was over 25. This he did, as it is stated on the authority of Fletcher Ingals that in case of myxo-fibroma, if the patients could be kept alive until they were over 25, there was a tendency to spontaneous arrest of the growth. However, the patient fell into the hands of a licensed quack. He laid his



nose open in the so-called heroic way, and attempted to extirpate the tumor, and the patient promptly died.

Dr. Redmond Payne said he had exhibited a similar specimen at the last meeting, which hung in the naso-pharynx and reached the isthmus of the pharynx; it was somewhat elastic, so that it would move, and was some five inches in length when it was stretched out. It was the largest that he had ever seen. Dr. Eaton's specimen is certainly an extraordinarily large one. The statement that these cases have a tendency to spontaneous atrophy after the patient reaches the age of 25 seemed to Dr. Payne a little curious. He recalled only lately a case, a very large tumor in the naso-pharynx, probably one-third the size of Dr. Eaton's specimen. The man was 32. It has shown no tendency to atrophy at all.

The President said that according to his experience he did not think that there is any rule that a tumor atrophies after a certain age.

Dr. Eaton (closing discussion) said that he had made no statement that a tumor has a tendency to atrophy after patient reaches the age of 25; but that after that age a nasal fibromyxoma may not grow any more. There is an arrest of growth. This is quoted on the authority of Fletcher Ingals. Ingals does not say that a tumor atrophies, but that after the age of 25 these tumors may not develop further, but become stationary.

#### CONVERGENT STRABISMUS.

Dr. L. C. Deane reported an operation for convergent strabismus. He presented the case, not on account of any peculiar features, but because he had taken a photograph before and after the operation. The patient was aged 12 years. When about 4 years of age, she had a severe attack of the measles, followed by a marked esotropia, which resolved itself into a fixed condition, the right eye squinting continually. Three years previous to consulting Dr. Deane, she was operated on by a local oculist, who evidently performed a tenotomy of both internal recti. The operation was followed with an unfavorable result, the eye remaining in approximately the same position as before. A year later, the mother feeling that something could be done, as the eye was a great disfigurement, consulted another oculist, who repeated the operation, with a similar result. Dr. Deane saw her first in June, 1900. R. V. 3/200, with +5 D. sph. +1.25 D. cyl. 80° V=20/100. L. V. 20/20. With a cycloplegic V. is 20/20 with +5 D. sph. +1. D. cyl. ax. 90° O. D +4.50s +1.25 cyl. ax. 80; O. S. +4.50 D. sph. +1 D. cyl. ax. 90 was prescribed to be worn continually.

The right eye converged 40 degrees and rolled up slightly. The child was going to the country for a few months, and practice was advised for the right eye by screening the left eye for six hours during the day. She returned in the middle of October, and while the right eye had gained nothing in

acuity of vision, she was able to fix with it, and this was very uncertain before practice. The eyes were now shown to be perfectly concomitant in their movements. On November 2 a complete tenotomy of the internal rectus muscle was done, also a tenotomy of the external rectus, advancing it, and re-stitching it to the globe by three scleral stitches. Five weeks after the operation, she had binocular single vision, though accompanied by occasional headaches and a homonymous diplopia. By a slight effort she could overcome the diplopia. Atropin was used for three weeks following the operation to eliminate all accommodation, and hence any hyper-convergent effort, during the process of healing. It is hard to predict the exact outcome of these cases, as several unmeasurable factors have to be taken into consideration. Cicatricial contraction has a tendency to counteract the effect of the operation. In this case, however, the contraction will be exerted on both sides, especially of the advanced muscle, which will have a contrary effect by improving the condition, providing the operation does not quite correct the defect, which is here the case. The reason for proceeding cautiously and awaiting the result after the healing and the formation of the scar tissue, is that there is a certain danger of such condition becoming over corrected. Here is an internal rectus muscle that has been completely tenotomized three times, and opposing it a muscle that has been shortened and advanced, with deep and strong scar tissue surrounding it. A tenotomy not only lessens the purchase a muscle has upon the globe by allowing it to retract, but also weakens its contractile power. It is well known, however, that an over-powerful muscle will become paretic by continual tenotomies, and allow its antagonist to draw the eye so as to produce an opposite heterotropia.

Dr. Eaton said that the pictures show a very good result. Advancement has many advantages. He thought the doctrine is correct that wherever possible, when a muscle is advanced in one eye, the same muscle in the other eye should be advanced; or, to put it in other words, or more correctly, whenever a new and more normal position is given to a muscle, the same muscle in the other eye should be treated in a corresponding manner.

Dr. Payne said he had seen this case of Dr. Deane's both before and after the operation; his impression of the case was that the converging was so far inward that the tenotomies were not complete and some fibers were left, probably above, which gave the eye the position; this, together with the scar tissue, impressed one that the two tenotomies had not been complete.

Dr. Barkan asked where Dr. Deane found the internal rectus muscle. In what position?

Dr. Deane replied, "In about its normal position, nearer to the cornea. The connections were enormous, extending along one-quarter the edge of the cornea. There was some converging power, enough to justify



one in making the advancement of the muscle."

#### STAPHYLOCOCCIC INFECTION.

The president presented some cultures which he had taken from the ear and throat of a little child 2½ years old, to which he was called in consultation. The little one showed at first an acute inflammation of the middle ear. He waited under expectant treatment for 48 hours, and then made a paracentesis of the drum. For a few hours no serous fluid was discharged from the middle ear; later some bloody serum did appear. The temperature was 102½ degrees at the beginning. On the third day the ear was nearly free of any discharge and the temperature normal. Forty-eight hours after this, a fever of 104 degrees set in, and as the ear did not show any symptoms, the throat was examined carefully. On the soft palate and on the right tonsil, a white patch about as large as a middle-size bean was found. Fearing these patches might be diphtheritic, a bacteriological examination was made, which revealed staphylococcus pyogenes albus, and also Pfeiffer's bacterium. We should be careful of our diagnosis before a bacteriological examination is made. Five days after this child was perfectly well.

#### RETINITIS PIGMENTOSA.

The president also reported a case of nyctalopia in a boy 17 years old, and showing retinitis pigmentosa.

The annual election of officers being in order, the following were elected: President, Dr. F. B. Eaton; first vice-president, Dr. L. C. Deane; second vice-president, Dr. R. D. Cohn; secretary, Dr. M. W. Fredrick; treasurer and librarian, Dr. G. W. Merritt; members of the executive committee, Drs. E. J. Overend and G. P. Pond.

## OBITUARY.

### IN MEMORIAM.

A. A. GLASSCOCK, M. D.

The death of a physician who worked in the interest of suffering humanity, under the impression that it was duty; who was free from the taint of commercialism, and who felt that there was a more substantial recompense for his life-sacrificing work than that of filthy lucre; who, in his relationship with the sick, obeyed the laws of his God; and who, in his intercourse with his professional brethren, complied with the exactions of the present much-neglected code of ethics, should receive more than a passing notice. Dr. A. A. Glasscock was born and raised in Missouri, where, at the age of eighteen, he found himself in charge of his father's plantation and a numerous colony of slaves to work it. It is characteristic of his noble, kindly nature that even at that early age he was noted for the

careful attention which he gave his black charges, as well as the animals on the place, when sick or injured. Four years later he entered the Missouri Medical College. At the close of the first term he entered the Confederate army, serving in it until the close of the war, participating in nearly all of the battles of the west, acting at first in the capacity of a private cavalryman, and subsequently as an assistant surgeon. He made many narrow escapes, and on one occasion had a horse killed beneath him. Resuming his studies, he graduated at his chosen college in 1868. After practising successfully in his native state until 1875, he removed to Humboldt County, California. During his sixteen years' residence there, he led the hazardous life of a western country practitioner, traveling, mainly on horseback, over mountain trails sixty, seventy, and even one hundred miles a day. It was a customary thing for him to be compelled in midwinter to swim the swollen Eel River naked, on horseback, his clothing carried in a bundle on his head. His location lacking the advantages which he thought his rapidly-growing children demanded, he removed to Lompoc in 1891, and five years subsequently he located in Ventura. On April 15, 1900, he submitted to a radical operation for the removal of an epithelioma of the tongue, one-half of the organ being removed, after ligation of the lingual and facial arteries. The benefit derived from the operation was of short duration, and after enduring agony with the same stoicism and heroism that characterized the last days of the similarly-afflicted great commander of the hosts with whom he had contended on many a battlefield, he succumbed to the disease on Dec. 11, 1900.

Dr. Glasscock belonged to that type of western country physicians that is fast passing away, and for whom, as yet, no American Ian MacLaren has appeared to commemorate their deeds. Remote from medical centers and surgical supplies, he necessarily, dependent on his own resources, became confident, self-reliant, and competent. To that experience which is only obtained at the bedside, he added the knowledge secured by hard study and post-graduate courses. Actuated by other motives than those of a mercenary character, he stood ever ready to respond to suffering humanity's call. To him no journey was too long, no mountain too high, no river too wide, no weather too bad, when duty called. Class distinction to him was unknown. To him Dives and Lazarus were the same.

"And well he knew to understand  
The poor man's cry as God's command."

His natural inclination was to the poor. Without wealth, he was a patron; without ostentation, he wielded an influence which was beneficial, refining, and far-reaching.

The Hon. Thos. F. Bayard, in an address to a medical class, thus referred to such a physician as was Dr. Glasscock: "It has been my personal fortune to know such a man.



It has been my privilege and delight to accompany him in his visits, where his chief medicines were the personal presence and conversation of the man himself. He had shared and lessened their anxieties, counseled the wayward, had led the sick back to health, cheered the weak-hearted, had rejoiced with them that did rejoice and wept with them that wept. And I have seen such a man so surrounded by an atmosphere of love and trust, holding, as it were, the heart-strings of a family in his hands, their guide, philosopher, and friend; and then I realized what a moral force in society the profession, properly comprehended and properly followed, was capable of exerting, and how relatively small, as part of its usefulness, was the administration of medicines."

This tribute to Dr. Glasscock comes from one who shared with him many a midnight vigil, many a tiresome journey, and many a conflict with death in the sick-room; comes from one who loved and who misses him; one whose hope is that he may emulate such a life as his; one who, knowing the man thoroughly, feels well assured that he has earned and received the blessing of the Great Physician, who said, "I was sick, and ye visited Me."

Cephas L. Bard.

## CORRESPONDENCE.

### JEFFERSON MEDICAL COLLEGE.

A new building has just been completed for use of the college proper. It is a very imposing structure, beautifully furnished and provided with every convenience in the laboratories and dissecting rooms. The most noteworthy feature is the museum, presenting a very large collection of pathological specimens gathered together principally by Professors Gross, Parvin, and Da Costa. About the entrance to the building is a frieze, inscribed with the names of Mutter, Eberle, Bache, Pancoast, Dunglison, Gross, McClellan, Mitchell, Meigs, Sims, Drake, Dickson. The building is situated in the heart of the city, and the clinic connected with it is very large, the average daily attendance being about three hundred.

**THE HOSPITAL.**—Jefferson Hospital is a very old institution, and is sadly in need of reconstruction. The large amphitheater, where Keen gives his surgical clinic, is modern, but the gynecological and private surgical operating rooms are old and poorly equipped. There are 14 private rooms and about one hundred and twenty beds in wards. Most of the ward patients are free, but those who can pay are charged one dollar a day. Plans are on foot for a new hospital in keeping with the new college building.

**GYNECOLOGY.**—As in almost every college in the east, the students are debarred from the gynecological clinic. Instruction is given through lectures, recitations, operative clinics, and examinations of patients

under an anesthetic. Dr. E. E. Montgomery is at the head of the department. He is a very large man, fine looking, and of attractive address. He is very quiet and deliberate in his operative work, and makes use of the simplest technique. In the removal of an ovarian cyst, for instance, he worked without gloves, without head coverings, with one assistant and two nurses. The operating room is small, dingy, and crowded with about twenty students. The most interesting feature of the operation was a running description of the various steps, by an assistant, who did not take part, but stood off and called attention to what the professor was doing. The effect to an onlooker was somewhat humorous. The operator himself did not say a word, but allowed the assistant to talk as much as he wanted to.

**SURGERY.**—The most interesting man connected with Jefferson College to-day is W. W. Keen. He is a small, wiry, quick-moving man, with gray beard and hair, and I should say about 55 years old. In a clinical lecture on a case of supposed diverticulum of the esophagus, he showed himself as an earnest, clear, and forcible speaker, using a modulated voice, but articulating very distinctly. In operating he appeared to be very rapid, clean, and neat. He does not use gloves. His technique seems to be very simple, using gauze sponges, catgut sutures and ligatures, Hagedorn needles, old-style thumb-catch hemostats, blunt dissection when possible. The case of diverticulum of the esophagus was an unusual one. Some years ago the man, while lifting, felt something give way in the region of the diaphragm. He was made very sick by the accident, and vomited blood. As time went on he found he had great difficulty in getting food to enter the stomach. It would seem too large and regurgitate, and in order to swallow into the stomach he would be compelled to drink at least a pint of water. In the experiments at the hospital a tube was introduced into the stomach, and a pint of milk poured in. The tube was then withdrawn and the man swallowed a glass of water. In a short time the man was able to vomit the water unmixed with the milk. Doctor Keen explained that the phenomena might be explained either by supposing a diverticulum or dilated esophagus. Photographs with the X-ray, taken with a fine coil of wire within the stomach tube and also with a long string of perforated shot in the esophagus, showed that the line passed down the left side of the spinal column. The shot could also be seen coiled up in a small mass at the level of the lower end of the esophagus. The photographs did not throw much light on the case. In the literature of the subject Doctor Keen said that he had only been able to find four cases on record for diverticulum, and thought that cases of dilated esophagus were still rarer. In the cases of diverticulum recorded, the majority took origin at the point below where the construction of the pharynx ends, and above



the point where the circular muscles begin. This is near the lower end of the pharynx. When the patient swallowed a large amount of water and retained it in the esophagus, it would cause swelling on each side of the neck and also great venous congestion from pressure on the vena cava. From the evidence at hand he decided to make his exploratory incision along the sterno-cleido-mastoid, retract the great vessels, and examine the esophagus at the point where diverticula were most common. This he did and, finding no evidence of the sac, announced that in one week he would open the stomach and explore the esophagus from its cardiac orifice.

Geo. B. Somers.

Philadelphia.

## BOOK REVIEWS.

"Obstetric Clinic," by Denslow Lewis, Ph. C., M. D., Professor of Gynecology in the Chicago Polyclinic; President of the Attending Staff of Cook County Hospital, Chicago. Octavo, 640 pages; price, \$3.00. E. H. Colegrove, 65 Randolph Street, Chicago.

This series of clinical lectures will appeal to the busy reader specially, as they deal with the cases commonly arising in obstetric practice and as they give the rare and anomalous conditions likely to be met. The writer has long been known as a lecturer on this subject, and the profession can now read the results of his extensive hospital and private practice, expressed in concise terms, even though they come without revision from the stenographer's hands. The arrangement is very good and the index quite complete. Paper, type, and binding do not comport with the excellence of the subject-matter."

"Manual of the Diseases of the Eye." For students and general practitioners; with 243 original illustrations, including 12 colored figures. By Charles H. May, M. D., Chief of Clinic and Instructor in Ophthalmology, Eye Department, College of Physicians and Surgeons, Medical Department, Columbia University, New York. New York, William Wood & Company, 1900. This volume, though not too large to be carried in the pocket, has in it in condensed form about all that can be assimilated by the general practitioner or student, unless they are studying this branch as a specialty. It is practical, systematic, thoroughly up-to-date, and is especially valuable for the clear, original cuts, which show the conditions mentioned, the means of examination, and the manner of treatment. It contains the most complete index we have seen in a small work, rendering it useful for quick reference work.

"International Clinics," Vol. III, Tenth Series, 1900. J. B. Lippincott Co., Philadelphia, 1900. Price, \$2.00. As has been the custom with this work, it again gives us the latest and best of the medical thought of the

world in assimilable form. This particular volume and series is up to the usual standard in matter, type, paper, and all the niceties of the publisher's art. Since it can be found on nearly every physician's table or shelf, it does not need extensive review. Suffice it to mention one or two articles, as "Coal Gas Poisoning," "Pathology and Treatment of Epilepsy," "Degeneracy," and a volume of others of equal merit, and the student of things medical will note the advantage in having such a book for perusal and reference. This is one of the best yet brought out, and is a marvel of excellence and learning.

"Laboratory Directions for Beginners in Bacteriology," an introduction to Practical Bacteriology for Students and Practitioners of Comparative and of Human Medicine. By Veranus A. Moore, B. S., M.D., Professor of Comparative Pathology and Bacteriology, New York State Veterinary College, and of Bacteriology, Cornell University Medical College, Ithaca, N. Y. Second edition, enlarged and revised. Boston, U. S. A., Ginn & Company, publishers, 1900. In the first place the book is a popular one, as evidenced by the second edition so soon after the first. For students, for whom it is especially arranged, it is splendidly adapted, as it will stimulate investigation, habits of observation, and remote care in the examination of cultures. Here he will find directions for the preparation of media and staining solutions. The page of laboratory maxims will fit his needs, as they have done for the students of Professor Moore. For the practitioner the convenient methods for bacteriological examinations of pus, etc., for staining tubercle bacilli, making the Widal test, and examining diphtheria cultures, recommend it highly. Its system of references is complete.

"A Clinical Treatise on Fractures," by William Barton Hopkins, M. D., Surgeon to the Pennsylvania Hospital and to the Orthopedic Hospital and Infirmary for Nervous Diseases. Philadelphia, J. B. Lippincott Co., 1900. By title and contents this work is declared to be a clinical treatise of fractures. It is quite the vogue now to publish lectures given on cases actually seen and lectured about in the clinical amphitheatre of the schools and hospitals. It has many advantages over hypothetical cases or cases handled only in one's study. The author of this work has placed in compact form his lectures on material seen and treated in the Pennsylvania Hospital, "so revised and elaborated as to eliminate the elements of incompleteness of clinical delivery and lack of method necessarily incident to utilizing clinical material." The reader need have no fear of finding pages of tiresome statistics to wade through, chapters devoted to obsolete methods, as neither are given space in this intensely practical work. The X-ray photographs are numerous and clear, and the cuts are well selected and well executed. Type, paper,



binding, and contents are well balanced, all being first class. The author's methods are clearly given and splendidly illustrated.

## MEDICAL NEWS.

### LICENSES GRANTED.

- 5846 Spangler, Milton H., Endicott, Neb., April 9, 1897, Medical College of Ohio.
- 5847 Walker, Nathaniel O., San Jacinto, May 22, 1856, University of Trinity, Canada; Dec. 17, 1856, Royal College Surgery, England.
- 5848 Watt, John M., Toronto, Ohio, June 15, 1882, Long Island College Hospital, N. Y.
- 5849 Young, J. Henry, Rock Springs, Wyo., March 24, 1900, Ohio Medical University, Ohio.
- 5850 Bell, John W., Minneapolis, Minn., March 2, 1876, Med. College of Ohio.
- 5851 Blass, Barney, San Francisco, April 11, 1900, Baltimore University School of Medicine, Md.
- 5852 Burrows, Fred Grant, San Francisco, June 30, 1897, Medical Department Harvard University, Mass.
- 5853 Cannaday, Chas. Graham, Roanoke City, Va., March 8, 1899, St. Louis College Physicians & Surgeons, Mo.
- 5854 Dalton, John Calvin, Pasadena, Feb. 26, 1874, Starling Med. College, Ohio.
- 5855 Dees, Wilmot W., Oakland, May 12, 1885, College Phys. and Surg., N. Y.
- 5856 Harris, Sylvia Fowler, San Francisco, June 22, 1899, Tuft's College Medical School, Mass.
- 5857 Howe, O. E., San Francisco, March 1, 1882, Medical College of Indiana.
- 5858 Hoyt, Alphus Whiting, Globe, Ariz., May 7, 1895, Medical Department University City of New York.
- 5859 Huff, W. H. R., Los Angeles, March 4, 1886, St. Louis Medical College, Mo. (Lieu Cert.)
- 5860 Klotz, Julius E., Vancouver, B. C., June 11, 1897, Toronto University, Ont.
- 5861 Levers, E. E., Piedmont, Wyo., April 5, 1898, Medical College of Ohio.
- 5862 Lopp, Wm H., San Francisco, Feb. 18, 1879, Medical Department University City of New York.
- 5863 MacDonald, Rufus Cyrene, San Francisco, June 27, 1883, Medical Department Harvard University, Mass.
- 5864 Malmgren, C. V., Manistique, Mich., May 22, 1895, Rush Med. College, Ill.
- 5865 Mills, Gilbert Pike, San Bernardino, March 28, 1892, Bellevue Hospital Medical College, N. Y.
- 5866 Oakwood, Chas. H., San Francisco, March 1, 1883, Medical College of Indiana.
- 5867 Onesti, Silvio Joseph, San Francisco, May 16, 1899, Medical Department University of California.
- 5868 Ringwell, Carl John, Minneapolis, Minn., June 4, 1891, Medical Department University of Minnesota.
- 5869 Sarle, Willis C., Corning, March 6, 1886, Medical Department University City of New York.
- 5870 Silverman, Herman, New York, April 16, 1896, University School of Medicine, Baltimore, Md.
- 5871 Slocum, Samuel C., Portland, Or., June 5, 1900, Cooper Medical College, Cal.
- 5872 Slocum, Chas. Wm., Rutland, Vt., July 6, 1882, Medical Department University of Vermont.
- 5873 Stovall, R. F., Los Angeles, Feb. 28, 1884, Medical Department University Louisville, Ky.
- 5874 Suarez, Alberto Camilo, New Orleans, June 13, 1900, Medical Department University of Pennsylvania.
- 5875 Thornton, David D., Denver, Colo., June 11, 1896, Medical Department N. W. University, Ill.
- 5876 Williams, Chas. Mallory, Pasadena, June 8, 1898, Columbia College Phys. and Surg., N. Y.
- Hogan, James, Joseph, Vallejo, Aug. 2, 1898, Member Royal College Surgeons, England; July 28, 1898, Lic. Royal College Physicians of London.
- 5877 Austin Thomas N., Santa Clara, March 13, 1891, Michigan College of Medicine and Surgery, Michigan.
- 5878 Bales, Clement Wood, Cathlamet, Wash., April 2, 1900, Medical Department University of Oregon.
- 5879 Bewley, Marietta H., San Francisco, June 14, 1900, College of Medicine, University of Southern California.
- 5880 Blondin, A. A., Alturas, Feb. 25, 1892, N. W. College, St. Joseph, Mo. (Lieu Cert.).
- 5881 Bowser, James Charles, North Ontario, March 31, 1883, McGill University, Montreal, Canada.
- 5882 Cavano, William M., Fresno, June 14, 1900, Medical Department Northwestern University, Illinois.
- 5883 Chittenden, Ravaud Hovey, Santa Cruz, June 28, 1868, Long Island College Hospital, N. Y., March 11, 1884, College Physicians and Surgeons, Chicago, Ill.
- 5884 Cooper, John H., Monrovia, Feb. 22, 1888, Medical Department University of Tennessee.
- 5885 Crabtree, Hezekiah Todd, San Francisco, June 15, 1899, Medical Department Northwestern University Woman's Medical School, Ill.
- 5886 Crenshaw, J. Myler, San Diego, Feb. 24, 1891, Louisville Medical College, Ky.
- 5887 Cronin, Thomas Joseph, Webster, Mass., April 7, 1898, Baltimore University School of Medicine, Md.
- 5888 Devitt, Thomas George, Grand Forks, N. D., April 4, 1894, University of Trinity College, Toronto, Canada.